

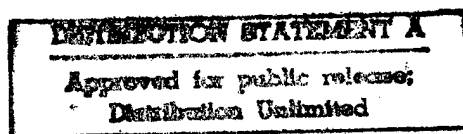
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24 APRIL 1987

# USSR Report

## NATIONAL ECONOMY



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24 APRIL 1987

# USSR REPORT

## NATIONAL ECONOMY

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## ECONOMIC POLICY, ORGANIZATION, MANAGEMENT

### ABALKIN CALLS FOR NEW ECONOMIC CONCEPTS IN RESTRUCTURING

Moscow EKONOMICHESKAYA GAZETA in Russian No 8, Feb 87 p 10

[Article by L. Abalkin, corresponding member of the USSR Academy of Sciences:  
"Quantity or Quality?"]

[Text] The very type of economic development is changing. This requires an appropriate restructuring in the system and methods of management and the breaking of existing stereotypes in thought and action. Without this it is impossible to break away from the captivity of inertia and to overcome the forces of hindrance discussed at the January Plenum of the CPSU Central Committee.

The magic of quantitative approaches and the cult of rates are some of the main obstacles on the path of advanced transformations. This is perhaps the main reason hampering a rise in efficiency and quality.

To Contrast?

Today everyone agrees that the quality of machines, accessories, consumer goods and services, engineering plans, and housing should be improved and fundamentally at that. As a rule, there are no disagreements here.

Usually, however, quality is stressed--this, of course, is good. However, should it be contrasted with quantitative growth? After all, we need both. Problems begin here. The position of those advocating the combination of quantitative growth with an improvement in quality seems very convincing. In fact, it is better to be "healthy and rich than poor and sick."

Thus, to contrast or not? Yes, to contrast. First of all, because today these guidelines are increasingly incompatible. It is impossible to solve the problem of fundamentally improving quality, while continuing to be guided by the quantitative growth of the production volume. Incidentally, Lenin's pithy formula "Less But Better Is Better" is based precisely on such a contrast.

However, will such a contrast not lead to a weakening of rates? Will it not contradict acceleration tasks?

The strategy of acceleration is by no means reduced to an increase in rates. Of course, a breakthrough is necessary here. The stagnant phenomena revealed at the end of the 1970's and at the beginning of the 1980's are alien to the socialist economy. However, it is totally incorrect to understand the acceleration strategy only as overcoming negative phenomena. It is generated by profound shifts in the structure of public reproduction and by new conditions of economic development. Its essence lies in the transition to the new quality of growth.

With regard to rates they should be higher than those formed during the noted years, but by no means excessive and even relatively lower than before the beginning of occurrence of stagnant processes. To double the national income and the volume of industrial production, by the year 2000 their average annual increase should make up 4.7 percent. During 1971-1975 the average annual increase in the national income was 5.1 percent and of industrial output, 7.4 percent. During the period until the year 2000, on the average, per-capita real income should grow by 3.2 to 4 percent annually, but in 1971-1975 its increase made up 4.4 percent.

Therefore, it is totally inadmissible to reduce the acceleration problem to quantitative growth and to consider the rates of the early 1970's ideal (this is inevitable with such a reduction). As the 27th CPSU Congress stressed, the essence of the changes lies in shifting the center of attention from quantitative indicators to quality and efficiency, from intermediate to final results, from an expansion of productive capital to its renovation, from an increase in fuel and raw material resources to an improvement in their utilization.

The mentioned contrast is clearly visible in these political formulas: on the one hand, quantity, expansion, and increase in intermediary results and, on the other, quality, renovation, and improvement in the utilization of final results.

To attain the reorientation of economic growth is a complex matter requiring time and vast efforts. Only as a result of persistent work measured in decades is it possible to reach the highest world goals of labor productivity, production efficiency, and the quality of output. Very often, however, we want to obtain results immediately and to report on this.

To increase the volume of output at higher rates than during the past five-year plan and last year, quarter, and month is the simplest thing for such a goal. And what about quality and scientific and technical progress? This is considered a secondary matter. More and more rapidly--this is the chief thing. Now, almost 1 year after the congress, as before, it is possible to observe a chase after volume, not acceleration. For the sake of this the assortment renovation is delayed and capacities of pilot production facilities are loaded with the output of mass products. For the sake of this rush work is organized. For the sake of momentary interests long-term strategic interests are sacrificed. Such actions discredit the acceleration strategy and hamper the transition to the new quality of growth.

Many are inclined to blame indicators, primarily volume and cost indicators, for everything. There is no denying that many indicators built according to the "expenditure" principle seriously hinder restructuring and hamper the transfer of the economy to the intensive path of development. Nevertheless, the root of all evil does not lie in them.

#### It Is Not a Matter of Indicators

Ideal indicators do not exist at all. The attempt to find among them an indicator capable of describing the entire complexity of modern dynamics is related to the search for the "philosophical stone," of course, with the same results.

However, even indicators "cleared" of material expenditures (net and standard-net output) are not much better. They also have a problem, that is, the ability to describe only the quantitative growth of volumes.

The task of increasing output by 43 percent was set for machine building for this five-year plan. Even if this assignment is fulfilled completely and on schedule, is it possible to attain a real acceleration in this case? Having information only about the volume--irrespective of whether it is calculated in commodity or net output--it is impossible to answer this question. After all, it is not at all a matter of producing more machines mastered a long time ago, which have become obsolete. Highly efficient, new equipment is needed. However, volume indicators are unable to reflect changes in quality and structure.

Even such a universal indicator as the physical volume of the national income taken in itself is unable to measure the entire complexity of economic dynamics. The point is that the difference between a fuller satisfaction of public needs and the settling of resources in stocks is hidden in its volume and rates of growth. At the expense of what sources--extensive or intensive--its growth is obtained is also hidden. For a description of the new quality of growth the real content of rates and the utilization of intensive acceleration sources are the most important.

It is incorrect to see the solution of the problem, as is sometimes considered, in the transition from value indicators to physical indicators. Possibly, the latter are even less suitable for evaluating the new quality of growth. By the year 2000 the doubling of the national income is to be attained with a reduction in its metal intensiveness by almost one-half and, in fact, with the stabilization of the present volume of steel output. For reference purposes: In 1985 we smelted 1.9-fold more steel than in the United States. If during the attainment of the envisaged assignments concerning the national income the volume of smelted steel output grows, this will be bad, not good.

For this five-year plan an increase of 10 percent in the output of rolled ferrous metal products is to be ensured without an increase in the output of smelted cast iron and with a reduction in coke consumption. And if metallurgists overfulfill the cast iron and coke plan? Will this be bad or good? Bad. So much for physical indicators.



This is how matters stand not only with raw material resources. There is a similar picture in the production of both means of labor and many consumer goods. The total output of metalcutting lathes (in thousands of units) was reduced from 231 in 1975 to 216 in 1980 and to 182 in 1985. During the same years the output of machine tools with numerical program control increased from 5,500 to 8,900 and 17,800 units. Consequently, it is not merely a matter of physical indicators. It is necessary to perceive structural shifts, to evaluate products according to their correspondence to the best world models, and to take into account the satisfaction of specific consumer needs.

In 1985 a total of 788 million pairs of shoes were manufactured as compared with 300 million in the United States (2.8 and 1.3 pairs per capita respectively). A simple quantitative increase in footwear of the quality well known to everyone is not needed. It is also possible to meet needs much better with a smaller quantity. Of course, some people, if they so desire, will call this an individual example. However, behind it there are also some very significant patterns. Their essence lies in the fact that, as quantitative growth approaches scientifically substantiated consumption norms, it loses its significance in the evaluation of the people's standard of living.

We will draw two more conclusions from our analysis.

First: Any indicator intended for measuring the quantitative volume of production is unable to describe the new quality of growth and its real content and structural shifts. Such indicators are suitable for an evaluation of economic dynamics only in inertial systems noted for an unchanged structure and a uniform nature of output. The time for such indicators has passed irrevocably.

Second: The volume of production taken in itself is not the carrier of the goal-oriented function of socialist production. Therefore, nor do indicators measuring this volume possess the criterial feature.

To evaluate economic dynamics, indicators of the full satisfaction of public needs with the most efficient utilization of resources should be found.

#### Guideline--Final Results

The new quality of growth is inseparably connected with its reorientation from intermediary to final results. The goal-oriented function of economic growth lies precisely in them and their attainment becomes the highest criterion of the quality of economic activity and realization of the capabilities of the socialist economy.

In accordance with this the entire planning system and the totality of economic levers and incentives should be restructured now.

Consequently, today the chief thing is to face the consumer, to study public needs attentively, and to create conditions for their fullest satisfaction. Planning and administration should be restructured accordingly. It is not a

matter of producing more. It is important to produce what the consumer needs--as much as and of the quality required by him. No more and no less.

The consumer's order formulated by a contract is designed to become the basis for the production program. With a sufficient balance of macroproportions it is possible not to establish at all centralized assignments for the volume of output either in value, or in physical measurements.

In such a case centralized planning is concentrated on an effective structural policy corresponding to shifts in the system of public needs, on ensuring a balance of the national economy, and on creating conditions for the consumer's real effect on production.

In accordance with what has been stated by no means volume indicators will occupy the main place in the state plan. On the basis of the system of established priorities they should determine structural shifts, measures to ensure an economic balance, and assignments for attaining a certain level of meeting needs.

The level of meeting needs includes the quality of output, speed of renovation of its assortment, and correspondence to the latest scientific and technical achievements and to the population's constantly changing needs. To evaluate all these aspects, an adequate, by no means traditional, system of indicators should be found. It is not simple to find it. In addition to the complexity of the problem itself, the inertia of old approaches hampers the search. However, only by developing such a system is it possible to really shift the center of gravity from quantitative to qualitative evaluations.

The efficiency of resource utilization is the second aspect of final results. Strictly speaking, this is the reverse side of meeting needs. The better resources are utilized, the more fully needs are met. Therefore, the management of efficiency becomes an immediate task.

The criticism set forth above concerned not rates in general, but only their utilization as purely quantitative indicators of the production volume. An increase in efficiency characterizes the quality of economic growth. This applies primarily to the productivity of social labor. To reach the goals of the year 2000, it is necessary to sharply increase the rates of growth of social labor productivity. They should make up 5.7 to 6.3 percent in average annual terms. We have not had such a growth for a long time.

It is possible to reach the goals set only along the paths of renovation. An increase in labor productivity should be attained not through an increase in production volumes, but through a decrease in the number of workers and their release. The distinctive characteristic of the new quality of growth lies in such a change of sources.

The management of efficiency presupposes an extensive utilization of economic standards as the most important social regulators. By means of them it is possible to implement an active resource-saving policy and to attain a reduction in expenditures of material and fuel-power resources per unit of useful effect.

It is not only a matter of planning certain indicators and assignments. As experience shows, it is possible to plan, but not to obtain, the expected effect. In order to attain substantial results, it is necessary to ensure a firm linkage of real interests. The mechanism of dependence of income on the attainment of planned goals should operate reliably and inevitably.

The path to such a mechanism lies through full cost accounting, through its transformation into an inseparable link of the unified system of planned management, and through a systematic orientation of this system toward a new quality of economic growth.

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## INVESTMENT, PRICES, BUDGET, FINANCE

### PLANNERS CONTINUE SEARCH FOR SOUND PRICE-SETTING METHODOLOGY

Moscow IZVESTIYA AKADEMII NAUK SSSR, SERIYA EKONOMICHESKAYA in Russian No 6,  
Nov-Dec 86 pp 43-55

[Article by Yu. V. Borozdin: "Working Out the General Concept of Improvement in the System of Prices and Price-Setting"; first paragraph is journal introduction]

[Text] The article examines the basic directions to further improve the system of prices and price-setting within the framework of the general concept of such a system. Characteristics of the prevailing methodology and practice of setting prices in the shift to primarily intensive methods of managing the economy are analyzed. The article formulates the scientific principles of planned price-setting in the stage of developed socialism and sets forth the ways and methods of putting these principles into effect in practical price-setting work.

Of all the gauges of value for inputs and results in socialist economics, prices play the most important role. Not only a correct assessment of the efficiency of public production, but many other aspects of the socialist economy under current conditions--the correspondence of material-physical and cost proportions, the provision of incentive to fulfill planned targets and accelerate the pace of scientific and technical progress, the effect of the law of distribution according to labor, every possible savings in material, labor and natural resources, and the like--depend on the soundness of planned prices and the adequacy with which they reflect the use value of products and actual national economic expenditures.

The new wording of the CPSU Program, adopted by the party's 27th congress, points out: "Price-setting has to be improved so that prices more accurately reflect the level of necessary public expenditures, as well as the quality of output and services; provide more active stimulation for scientific and technical progress, resource conservation, improvement in the technical-economic and consumer attributes of products, and introduction of everything that is advanced; and reinforce the practice of economy" (2, p 149). Obviously, extremely important functions are being conferred upon prices, and the acceleration of socioeconomic development, that is, solution of our society's most important task, which is truly programmed in nature, depends to a considerable degree on the extent to which they are carried out.

As far back as the June (1983) Plenum of the CPSU Central Committee, the necessity of working out one of the most pressing economic problems--formulation of the principles for scientifically sound price-setting--was emphasized. It is clear that these principles should follow from the general concept of improvement in the economic mechanism, inasmuch as prices not only form an integral part of this mechanism, but permeate all economic relationships, standing out as basically the only tool for establishing the commensuration of expenditures and results at all levels of planned management of the economy.

The system of prices prevailing in the national economy represents the intercoordinated sum total of all types of prices for output and rates for services which maintain the economic turnover of enterprises, associations, sectors and regions, as well as the economic interrelationships of the state as a whole, individual economic units and the population. This system undergoes specific changes in each stage of the national economy's development. They usually take place in two directions: the theoretical-methodological aspect of improvement in the overall pattern of a price or its individual parameters, and a review of the levels and relationships of prices. Many years of scientific research and practical experience in the field of prices and price-setting have made it possible to work out a number of useful theoretical propositions and methodical recommendations which are now being utilized in economic practice, but at the same time, the concept of improvement in the price system for the near future (10 to 15 years) has not been developed to date.

Inasmuch as the system of prices constitutes an extremely important part--but a part all the same--of the prevailing economic mechanism, the necessity for radical improvement in which continues to be the focus of the CPSU, its basic drawbacks are linked with the overall condition of this mechanism. For this reason, basic improvement in the price system cannot be carried out in an isolated manner without affecting the overall system of management, planning, financing and provision of economic incentive for public production. At the same time, the price system, which reflects the advantages and shortcomings of the entire economic system, also has characteristics which are sufficient for the present stage of development of socialist production relationships. There is no doubt that the planned nature of setting and changing prices, the fact that they are not subject to spontaneous market fluctuations, and their utilization by the state as an important lever of economic management have to be classified as its advantages. At the same time, there are also unresolved problems inherent in the system of prices and price-setting, among which we must include: the lack of scientific price-setting principles, which should be implemented in practical work for fixing and applying prices; prices' lack of conformity to socially necessary labor inputs; the lack of coordination of production planning and product distribution with price planning; the lack of balance in the material-physical and cost proportions in the national economy; the inefficient effect of prices on stimulation of scientific and technical progress and adherence to a policy of economy and efficient use of production resources; and insufficient price elasticity.

It must be added that for the most part, prices have been bearing the accounting burden of measuring current expenditures for production until now, simultaneously meeting the requirement of formal cost accounting [khozraschet], in which the standardized profit reflected in the prices provides for the interests of individual associations and enterprises. At the same time, principally current expenditures are taken into account in the prices, but the national economic impact in production input is taken into account in prices on an extremely small scale (5 to 7 percent of its overall magnitude); practically no rent is being recovered because of the unsound pattern of prices for the output of sectors involved with the use of natural resources.

As a rule, prices are established not on the basis of the socially necessary level of expenditures, but on the level that has taken shape. This leads not only to an external manifestation of the expenditure principle--the tendency to overestimate expenditures in order to obtain higher prices, but to a situation in which economic units are focused extremely poorly on achievement of the highest national economic end results, which are the large numbers of use values that have been created. Orientation of prices toward actual expenditures practically eliminates the opportunity to calculate the beneficial impact of output and its public use value, and it is no coincidence that these factors are not fully reflected in the prices, but only as some "makeweight" toward the level of current expenditures.

In view of the fact that the price-setting process proceeds from individual expenditures, prices are not determining the socially necessary level of these expenditures, but the expenditures themselves formulate the level of the prices. The criterion is thereby lost--what is really beneficial from a national economic standpoint, and what is not. The expenditure principle in itself does not require a complex approach to the processes of planning, financing, extension of credit, provision of economic incentive and other processes, inasmuch as it is enough in this case to have an estimate and established standard of profitability to set the price. In this connection, it is no coincidence that the appeals by economic scientists over many years to "link up" the plan and prices, prices and revenues, prices and material and technical supply, and the like remain up in the air.

Participation by the consumers of output in the process of price-setting has been very insignificant thus far. The main economic reason for this is that the level of wholesale prices essentially is of no concern to the consumers of capital goods, since when there is strict fund allocation in the distribution of resources and output and the appropriate financing procedure, the consumer will be allocated the necessary funds for reimbursement of expenditures to purchase at any prices. Moreover, in many cases the consumer begins to have an economic interest in higher prices for output he acquires, since his expenditures and profit increase as a result, inasmuch as the latter is added on to the same expenditures in accordance with the standard of profitability. A graphic example of this, let us say, is the practice of our capital construction, where the striving to utilize funds to the maximum extent is nothing more than striving to increase expenditures and the cost of the construction itself. The basic way of resolving this problem is by organizing wholesale trade with capital goods, restructuring the system of financing and

extension of credit to sectors, associations and enterprises by allocating strictly fixed sums to them for purchasing the needed capital goods and by giving them the opportunity to acquire capital goods on the market. It is obvious that in this case the role of the consumer may be substantially increased in determining the limit and contract prices, which are now established under the pressure of the producers, as a rule.

The concept itself of limit prices, as the prices which are the maximum allowable in accordance with the conditions for consumption of products and provide the consumer with advantages for their acquisition and use compared with the substituted (base) products, originated as far back as the early 1960's and was unquestionably a progressive one. However, experience showed that the producer "liked" such prices only until they exceeded the level of his production expenditures, and were higher than normative profit at the same time. And if the limit prices proved to be lower or even roughly equivalent to the planned production cost of manufacturing the output, such prices were "adjusted" excessively high under the producers' pressure. The end of the matter was that the producer essentially began to determine the limit prices, and they were only formally coordinated with the customer, who was not concerned in general with price level under the economic mechanism in effect, as we have already noted.

And the price-setting organs are approving those projected prices which are worked out by producer organizations, based at the same time, naturally, primarily on the level of expenditures, but not at all on the national economic impact of the output in consumption.

The same thing may be stated in principle about the practice of determining contractual prices, with the difference only that here the consumer has been put in more difficult circumstances, for our contractual prices are established basically for output produced for one-time orders, for which the producer may set a higher level of expenditures.

A decisive turn toward national economic end results in price-setting is a necessary condition for changing prices into a tool to actively influence national economic processes.

One of the most important problems, which is difficult to resolve without improving the system of price-setting, is providing for the balancing of the natural-physical and financial flows in the process of formulating and carrying out the national economic plan. At the same time, the urgency of research in this direction and solution of the problem in the final analysis will invariably increase with time.

The increase in diversity of both production and consumer output being turned out and the rapid updating of the product mix at present are responsible for rapid fluctuation in production and personal demands; they complicate, and in a number of cases make impossible, the planning and evaluation of the work of economic organizations with the aid of physical measuring instruments.

Obviously it is impossible to resolve this problem only through improvement in the system of prices and price-setting. Improvement in centralized planning

by concentrating the efforts of planning organs on the main directions for developing the economy, an increase in the economic independence of associations and enterprises, measures to reinforce planning and labor discipline, and so forth should play an important role here. Precisely a comprehensive approach appears the most fruitful in resolving the problem of providing for balance in the national economy.

Effective utilization of prices to resolve this problem depends to a large extent on interpretation of the concepts of price stability and elasticity and their subsequent application in the practice of price-setting. From our point of view, the stability of prices may be discussed only with relation to their overall level and the level of prices for the basic types of capital goods and consumer goods. For this reason, ensuring price stability is a task for long-term national economic planning, and its solution requires manipulation of a comprehensive nature.

Price elasticity is a concept which is localized to a greater extent, basically characterizing efficiency in the use of specific capital goods and the possibility of meeting the people's demand for specific consumer goods. Providing for price elasticity to a large extent is linked with the expansion of economic independence and growth of the initiative and socialist energy of enterprises and associations.

Prices should play an important role in making the consumption pattern more efficient. The influence of the level and structure of retail prices on the effective demand of the population, and thereby on consumption, is an obvious fact, although it is not always taken into account in planning. At the same time, the influence of wholesale prices on the formulation of associations' and enterprises' production programs at present has been substantially weakened; this has resulted basically from an increase in the number of indicators planned, including the variety of output produced, by higher organizations. This practice, possibly necessary under conditions of extensive direction of the economy, when principal attention has been devoted to quantitative indicators of economic growth, does not contribute to the influence of consumption on production and does not create a real economic interrelationship between production and consumption, and consequently, the process of formulating an efficient pattern of consumption becomes poorly controlled.

Joint utilization of wholesale and retail prices for the purpose of regulating the interrelationship between production and consumption is a necessary condition for systematic management of the population's demand, and thereby for formulation of an efficient consumption pattern. Of course, this problem may only be resolved efficiently in a comprehensive manner, by improving the organizational forms of managing the national economy, the financial relationships between the budget, the bank and enterprises, and so forth.

The viewpoint is widely held in domestic science and practice that price plays an auxiliary role with respect to the national economic plan. Two conclusions follow from this position: 1) all the basic directions of the country's economic activity are specified in the plan, and for this reason the active role of prices may appear only on a microlevel in the process of resolving



individual economic problems; and the problems of balancing on a national economic scale, planned change in the proportions for development of the economy, selection of directions for scientific and technical progress, the capital investments policy, and so forth should be resolved firsthand in the plan by means of direct distribution of resources; and 2) the development of proposals for improvement of the methodology and practice of price-setting is based as a rule on the needs of price-setting itself as some isolated system of economic management, whereas prices are actually only an element of the overall system of economic tools utilized in the national economy.

In working out the concept of improvement in the price system it is necessary, in our view, to proceed from the general directions of reorganization of the entire economic mechanism with the objective of achieving high efficiency in public production, development of intensive methods of economic management, acceleration of scientific and technical progress, and an increase in labor productivity on this basis.

Acceleration of socioeconomic development is not only a problem of increasing the rates of economic growth, but the task of qualitative transformation of productive forces and production relationships under conditions of principally intensive methods of economic management. The starting point of this transformation in economic management is the achievement of balance in the national economy, that is, bringing resources and requirements into real conformity. It is clear that an unbalanced economy engenders a multitude of problems, including the presence of disproportions, shortages or relative surpluses, disruption of the normal course of reproduction, continuous plan adjustments, variation in economic standards, and so forth. For this reason, the task of achieving economic equilibrium in the national economy, leading subsequently onto the most favorable path for its development, has to be considered fundamental. Under these conditions, the basic conceptual requirement for development of the price system is to provide for overall dynamic economic equilibrium in the national economy.

The objectivity of this requirement is based on the entire system of socialism's economic laws, but primarily the basic economic law, the law of systematic and proportionate development of the economy, the law of value, the law of monetary circulation. In our view, examination even in a general way of the effect of each of the laws on the system of prices appears to be a very scholastic occupation, for the formulation of the many lines of "influence" without strict quantitative links among them remains only a call for the development of a "good" price system which takes objective economic laws into account.

We think that the starting point of working out the concept of developing a system of prices is the consciously supported proportionality, objectively inherent in socialism with its planned method of economic management, under conditions of balance in all the basic parameters of the economy and active utilization of trade and monetary relationships. The lack of such a balance, if the subjective factor of errors and omissions in planning is discarded, attests to the presence and maintenance of disproportions in economic development which have an adverse effect on the economic situation as a whole,

and also to the fact that the price system (in whole or in part) is "involved" in the existence of such disproportions.

Moreover, it would be a mistake to assume that all existing disproportions can be corrected by just varying the prices. By holding to the viewpoint of price "adjustment" for the relationships which actually take shape between resources and effective demands, let us say, we are voluntarily or unvoluntarily depriving prices of their inherent objective basis and changing them into a tool of economic policy. But there is such a basis, meanwhile. Practically all economists recognize socially necessary expenditures as the basis of planned prices. But this is a common opinion only with respect to the name of a category. When the discussion turns to disclosure of its content, there are many points of view which differ quite substantially with each other.

We cannot fail to note, however, that discussions concerning socially necessary expenditures revolve basically around the possible methods of their quantitative determination on the basis of average sectorial actual or normative production expenditures; group, zone or regional outlays; maximum or closed expenditures, and the like. In the process, we lose sight of an aspect such as socially necessary expenditures.

As we know, the objective of socialist production is to meet public demands--production and personal--to the fullest possible extent. The output produced and the services are intended precisely to meet the demands, and for that reason the expenditures for their production cannot be viewed without reference to the extent to which they meet these public demands. The degree to which they are met, in turn, depends on the public use value of the output produced and the services. In Marxist political economy, the connection between public demand and use value is interpreted clearly: "...as USE VALUE, a product possesses a certain limit, and namely, the limit of demand existing for it... Where the demand for any specific use value is discontinued, the product ceases to be a use value. As use value, a product is rated by the demand for it." (1)

Thus, socially necessary expenditures may be considered only those which are connected, first of all, with meeting some demand and secondly, which do not exceed a certain limit in the form of overall savings in labor and goods in the field of consumption, that is, where public use value is realized. The public necessity for production expenditures, consequently, is determined by the magnitude of consumer impact obtained in the process of making use of output or services.

In addition, socially necessary expenditures are not "indifferent" to the relationships which take shape between resources and demands. If effective demands exceed the supply of output or services, the socially necessary expenditures will be more than the actual expenditures for the amount of this excess, and vice versa. And only under the condition of parity between the volumes of supply and public demand for output or services will they be in line with the full national economic expenditures for their reproduction.

In turn, the full expenditures for reproduction involve not only current physical inputs, but the inputs of living labor and capital investments adjusted to current physical inputs in accordance with the appropriate standards of efficiency which reflect the reproductive aspect of the problem, as well as the corresponding amounts of rent in sectors engaged in the exploitation of natural resources.

But this is only a general approach to the problem of improving prices in bringing them as close as possible to socially necessary expenditures. Price is a highly complex politico-economic category which is influenced by all aspects of the reproductive process. For this reason, it is important to formulate basic principles of scientifically sound price-setting in order to orient practice toward development of such a system in the national economy which not only contributes to solution of the problem of balance, but transforms prices into an effective tool for increasing the efficiency of public production.

The following may be considered such principles of price-setting:

--provision for combined development of national economic plans and prices which provide incentive to fulfill these plans;

--calculation in the initial price model of payments for production resources utilized--funds, living labor, and natural resources;

--transformation of prices into the standard for national economic expenditures and production results; and coordination of overall (public) and local (associations, enterprises) economic interests in the price system;

--taking the public usefulness and socioeconomic effectiveness of output in consumption into account in prices; and reflecting the shortage or relative surplus of output in prices to achieve economic equilibrium; and

--efficient combination of centralization and decentralization in establishing prices; and ensuring price stability and elasticity.

These principles should be viewed not as a simple list of requirements for the price system, but as the common methodological foundation on which planned price-setting should be based in the near future.

The assumption is virtually indisputable that all the instruments for planned influence on production in a centrally managed economy should be intercoordinated and represent a consistent system oriented toward achievement of the highest national economic end results. Inasmuch as the national economic plan rightfully holds the dominant position in this system, the role of other instruments of economic management (prices, finances, credit, economic incentive funds, and so forth) should be applied to stimulate its fulfillment, resolving its "special" problems at the same time in conformity with the functions of each of these instruments. Obviously, a situation in which the plan provides for increasing output of some product over the five-year plan, by 50 percent, let us say, and the price affecting this product

does not even provide for recovery of expenditures has to be considered unnatural. The opposite also is encountered in practice, where a product has become obsolete, the plan calls for gradual reduction of its production, but the price provides the producer with profitability above the standard level.

All this attests to discrepancies in the "plan-price" system, and more accurately, even to the fact that the process of planning production and price-setting has been disrupted--the plan is drawn up on the basis of prices in effect, but the prices are set separately from the plan, guided only by the level of production costs.

It has become urgently necessary to provide each five-year plan with its own system of prices, that is, the plan is drafted simultaneously with the adjustment of list prices (if the need arises) or with the preparation of new price lists. This work is no more labor-intensive than drawing up the national economic plan, and it may be based in principle on the same economic data. The price-setting organs have been fully prepared for it, since prices for the 5-year period are now being significantly updated in the procedure for their current adjustment (by more than 50 percent in machine building, for example). Problems such as stimulating the production of highly efficient output with the aid of prices, the effect of prices on the policy of economy and optimum use of natural resources, the organization of efficient specialization and production subcontracting, and so forth will be resolved more successfully in the process of working out the plan and setting prices in a synchronized manner. At the same time, the role of prices in providing for overall and structural balance of the physical-material and cost proportions in the national economy will be increased.

Shifting our practice of price-setting to a new base model price, in which payments for all forms of production resources being used--labor, natural, and production funds--should be taken into account as part of national economic expenditures remains an extremely important problem.

The shift to price formation on the basis of the public use value of output, taking into account the total national economic expenditures, including the charge for utilization of labor resources, production funds and natural resources together with payment for current inputs of materialized and living labor, is a natural development and logical conclusion of the trends in improving planned price-setting characteristic of the past 15 years (the introduction of payments for stocks of minerals used, the increase in rates of deductions for social insurance, and so forth). The new and fundamentally important features here should be: a) mutually coordinated determination of the rates of payments for production resources, taking into account the scales planned for their reproduction, which will in fact make it possible to "link up" the planning of prices and financial and physical-material proportions; and b) transformation of the payments for production resources into a basic source for state budget revenues.

The standardized coefficients for utilizing production resources, being the coefficients of payment for their use at the same time, should replace the norms of profitability now being applied in practice, or if they appear under this name in the price, they should coincide quantitatively with them. In

this case, we will succeed in "linking up" the methodologies of determining economic efficiency and price-setting, which in itself is a task of extraordinary importance.

The prices established on the basis of public use value of output and reflecting total national economic expenditures, taking into account the payments for all forms of production resources utilized, should become the public standard on the basis of which individual expenditures are evaluated. In this case, priority is ensured for national economic interests in setting prices, and the process of price-setting does not proceed "from below"--from the individual expenditures of enterprises, but "from above"--from the amount of public use value of output and the standardized indicators for utilization of production resources. The economic interests of enterprises, consisting of the receipt of a specific amount of profit and formation of economic incentive funds, will be observed when the level of production expenditures for the output they produce proves to be lower than the price established for it, and where the price is not one made up of "cubic centimeters" of individual expenditures and standardized profit, but is a price as the public standard of expenditures established from a national economic standpoint. This means that the so-called cost accounting interests of individual enterprises cannot be the main criterion for determining the price level, but should be viewed only from the standpoint of that mechanism where prices are not a derivative but have measured individual expenditures.

Such an approach logically leads to the mechanism of accounting in prices of the public usefulness and socioeconomic effectiveness of output in consumption.

It is now difficult to find an economist who immediately identifies any reference to the category of usefulness with theses advanced at one time by the Austrian school of political economy. Moreover, more and more of our political economists recognize the citizenship of this category not only in the specifically applied aspect of economic science, but in socialism's political economy itself as well. Moreover, it must be stated that the practice of planning (and price-setting to a definite extent) has always utilized one mechanism or another for considering output and resources in accordance with their public usefulness. Inasmuch as there has not been (and still is not) a single theoretical-methodological concept for calculating usefulness in planning and price-setting, different criteria have been utilized in practice--from specific technical economic criteria (the heat-producing capacity of fuel, the metal value of ore, the carrying capacity of a motor vehicle, and the like) to generalized sociopolitical criteria (the need for accelerated development of the base sectors of industry, the change in relationship between the savings fund and consumption fund in the national income, and the like).

Economic science's lag behind the requirements of practice in the problem of taking public usefulness into account in planning and price-setting and the socioeconomic effectiveness of output in consumption can be corrected by utilizing two approaches simultaneously: analysis and dissemination of practical experience in this matter and thorough development of the

theoretical concept of establishing the essential nature of the planned price, based on tenets of the theory of optimal functioning of socialist economy.

As far as the first approach is concerned, planning practice and the practice of price-setting make extensive use of estimates of economic efficiency, maximum (limit) prices, parametric methods of price-setting, coordination of prices according to consumer attributes in groups of interchangeable products, and so forth. All these methods are aimed at overcoming the expenditure approach, but inasmuch as they are not based on a unified concept, they often are palliative and inconsistent in nature.

The second approach rests on one of the most important conclusions of the theory of optimal functioning of socialist economy, which is that the evaluation (price) of any product or resource which has become part of the best plan characterizes its contribution to the criterion of the plan's optimality. This means that the prices in the best plan are very closely connected with both the input and result aspects of production, which is the degree to which public demands are met, inasmuch as the minimum of expenditures of all production resources in the reciprocal problem corresponds to the maximum of the function of public usefulness in the original problem. Since the public usefulness of output, even in the traditional interpretation, is nothing more than its capacity to meet public demands, only the prices of the best plan resolve the problem of calculating the public usefulness and socioeconomic effectiveness of output in consumption most consistently. But inasmuch as such a price system cannot be acquired before development of the optimal national economic plan, we have to approach it by stages, proceeding from the concepts and principles of optimal planning. Such an approach is by no means at variance with the generally accepted interpretation of public usefulness as a category which includes all the products being produced to meet one public demand or another. And while use value of a specific item does not depend on how many or how few have been produced within the framework of public demand, the magnitude of public usefulness of the sum total of those same items fluctuates in relation to the extent that public demand is met.

Under current conditions, prices are based primarily on expenditures which have not been adjusted for the amount of public demand for similar or interchangeable output which meets the given demand. For this reason, the actual production expenditures taken into account in price-setting may deviate to one side or the other of the socially necessary expenditures. Under these conditions, calculation of the public usefulness factor in prices is nothing more than the conscious deviation of prices from the expenditure basis now applied in practice, as a rule in the form of the average sectorial production cost of manufacturing the output. At the same time, cases where examples of such deviations substantially exceed the "basis" itself are possible.

In price-setting for consumer goods, public usefulness of output may be reflected primarily through calculation of demand. In this case, the general pattern of determining prices is as follows:

--the prices should recover the expenditures on production of the output which meets public demand if the supply of this output does not exceed the effective demand for it;

--the accounting relationships in prices for consumer items should be established by taking into account the relative content of useful properties that are objectively provided when there is parity in demand and supply;

--final substantiation of the level and relationships of prices for specific types of output which meet one public demand or another is conducted by taking the conditions of production and sale into the fullest possible account. At the same time, adjustment of prices is possible for the purpose of some incentive or limitation in the consumption of specific types of output.

In price-setting for capital goods, calculation of the public usefulness of output assumes a different composition than for consumer goods, for the usefulness in itself here, as a rule, is manifested in strict quantitative magnitudes of the output's economic impact in the process of its production consumption.

The problems of reflecting a shortage or relative surplus of output in prices in order to achieve economic equilibrium are closely related to the problem of calculating public usefulness.

The development of a shortage or relative surplus is a consequence of the emergence of individual disproportions in the economy's development. These disproportions may be corrected in principle in two ways: firstly, by increasing or reducing production when there is a fixed level of prices, and secondly, by an appropriate change in prices so that they have a purposeful effect on demand. Both ways are utilized in our practice, which is generally fully justified, although the nature of the output produced itself has to be viewed here as the starting point in methods of regulating supply and demand. Where we are concerned with essential items and production regulation is possible within sufficiently broad limits on the basis of available production capacities, we have to utilize the first way for the most part; where goods that are not essential (luxury and prestige goods) which also have inherent limitations on their output are involved, the flexible mechanism of price-setting, which reacts sensitively to change in demand, has to be more widely utilized.

The link between calculation of a shortage of output in price-setting and calculation of public usefulness and socioeconomic effectiveness of output in consumption is demonstrated first of all by the fact that the more effective the output, the more potential consumers it has. If we rank these consumers by the magnitude of results they obtain from use of such output, we find certain areas of application where demand should be consistently satisfied, beginning with the area where the consumer impact is the greatest, and ending with the last area, where the impact is lowest. Both the shortage and diversified effectiveness of output according to areas of application are taken into account where available resources over one specific period or another do not provide for the demands made. Then the extent of the impact in the next area of application has to be taken into account in the prices. It

will be the area with the lowest level of consumer impact with a given balance of resources and demands, and the balance in itself should be established in accordance with the extent to which the demands of areas with declining effectiveness are consistently satisfied. The price established by taking into account the amount of impact in the adjacent area of application will economically "cut off" all consumers for whom the impact is lower. In this way, the problem of calculation in prices for both shortage and diversified effectiveness is resolved at the same time.

Prices are extraordinarily important in selecting one version of planning solutions or another, as well as for evaluating the effectiveness of economic measures. In certain cases, particularly in implementing economic measures in the current five-year plan, the prices and rates in effect may be utilized for these purposes if they are adequately justified economically. However, for large-scale measures with periods for implementation which go beyond the limits of planned periods, the prices in effect should be either adjusted or replaced by planned accounting prices. This is related first of all to the principal drawback of prices in effect--orientation toward average sectorial current expenditures and today's production conditions, which may be overcome by transforming the base price model in a specific manner and by taking into account the reproduction of the forthcoming period.

The use of prices as an element of the standardized base for calculations of effectiveness presupposes their conformity with the following requirements:

--the basis of the prices should be the overall magnitude of the economic impact of output in the area of consumption which exceeds or coincides with forthcoming expenditures (during the period the prices are in effect) for reproduction of a unit of output (services), taking into account scientific and technical progress and expected changes in the natural conditions of production, requirements for protection of the environment and social standards. At the same time, extra charges on wages in accordance with established standards, as well as payments for production funds and natural resources being used, which are set in conformity with standards for capital investment efficiency and assessment of natural resources, should be considered as expenditures;

--the levels of prices for specific forms of output and services should take their quality and use effectiveness in the national economy into account, by providing for production savings and the use of advanced types of output, as well as the planned balance of demand and resources in accordance with the entire products list of items being turned out;

--the conditions of the international division of labor have to be taken into account in justifying the level and relationships of prices.

Inasmuch as prices under the price list in effect do not meet these requirements, as a rule, the necessity arises of determining planned accounting prices to evaluate the effectiveness of large-scale economic measures; at the same time, a mandatory prerequisite for their determination is the maximum possible consideration of the effect of scientific and technical progress on the dynamics of expenditures for production and the



effectiveness of the output's use. At the same time, the planned accounting prices will be the basis for price list prices established for the following 5-year period.

Systematic management of price movement should be carried out within specific organizational limits, assuming efficient coordination of centralization and decentralization in establishing the prices, as well as provision for the necessary price stability and elasticity. The far-flung system of price-setting organs, including sectorial subunits for prices, establishes the conditions for differentiation in setting prices at all levels of economic management. However, this system functions to a certain extent separately from the system of planning and material and technical supply, basing itself essentially at the limits of the "sphere of influence" of central, sectorial and local price-setting organs on the basis of the output's importance.

Providing for price stability and elasticity is an extremely important and very complicated problem. One would think that these are mutually exclusive requirements which are impossible to implement in practice. In fact, everything depends on how price stability and elasticity are understood. If we mean a specific article or even a group of articles, then naturally it is impossible to have stable and flexible prices simultaneously. So this may involve various levels of examining this problem--national economic (the system of prices as a whole by areas of production), sectorial (a system of individual price lists), and individual (prices of specific products).

At the national economic level, the system of prices may be considered stable in the period from one overall reform (mass review) to another. In the time interval between reforms individual price adjustments are made, and current price-setting work is carried out, although it does not affect the overall level of prices and rates for all areas of physical production and the nonproduction area.

At the sectorial level, the price system may be considered stable if the price lists for the sector's output are not revised, and current adjustment of prices consists only of the approval of supplements for new output. Here stability and elasticity are also linked to a large extent with overall price revisions, for centralized price changes in industry are carried out as a minimum by groups of sectors, as a rule.

Finally, the problem of price stability and elasticity on the individual level is extremely clear: if the price of one article or another is constant for an established period of time, it is stable; if it changes, it is elastic.

The interests of planning organs, associations (enterprises) and price-setting organs are evident in the problem of providing for price stability and elasticity. The former are concerned with the invariability of prices for the purpose of achieving stability for the cost indicators of the plans and economic incentive norms established for a 5-year plan period. In addition, enterprises and associations also are concerned with stable prices (if they are concerned with elastic prices, only with respect to their increase), inasmuch as the stability of their cost accounting indicators depends on this. Price-setting organs, on the other hand, work toward constant price changes as

the output production conditions change, for a kind of profitability standard lies at the basis of their activity. The point of this is that the price of an item should be revised if the profitability has substantially exceeded the standard level. Inasmuch as the extent of this excess has not been established anywhere, considerable scope is provided for resolute decisions. It seems that the criterion for equalizing profitability cannot be considered well-grounded in general, since on the one hand, it brings to naught enterprises' efforts to reduce production expenditures, and on the other hand, it does not make it possible to create an effective price stimulus for the production of highly efficient output which provides for significant savings in the national economy.

Solution of the problem of combining price stability and elasticity in principle should be examined in unity with the problem of national economic planning--the measure of plans' stability is the measure of prices' stability, and any kind of price adjustment within the plan periods may be carried out with the appropriate adjustments of plan indicators.

Moreover, it is possible and necessary to utilize certain forms of elastic price-setting. In particular, for the system of wholesale prices this may be the so-called variable prices, fixed in price lists and reduced in established periods in accordance with the changes in production conditions and output sales planned for the future; for consumer goods, it is expedient to extend the practice of seasonal price differentiation and a more flexible consideration of supply and demand for prestige and luxury goods in price-setting.

The problems of improving the system of prices which have been examined are basically conceptual in nature. Some of them require further, more thorough study and practical approval. At the same time, it is clear that implementation in price-setting practice of the basic propositions of the concepts set forth are in full accord with the position advanced by M. S. Gorbachev in the Political Report to the CPSU Central Committee at the party's 27th congress: "We have to give prices greater elasticity and coordinate their level not only with expenditures, but with the consumer characteristics of goods, the effectiveness of articles, and the extent to which the product being produced is in balance with public requirements and the people's demand" (2, p 35).

#### FOOTNOTES

1. K. Marx and F. Engels, "Sochineniya" [Works], 2d edition, Vol 46, Part I, p 381.
2. "Materialy XXVII syezda KPSS" [Materials on the 27th CPSU Congress], Moscow, Politizdat, 1986.

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GOSAGROPROM SYSTEM POTENTIAL SEEN NOT FULLY UTILIZED

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[Article by I. Ushachev, doctor of economic sciences, professor, and Yu. Tkai, candidate of economic sciences, docent (VNIESKh) [All-Union Scientific Institute for Agricultural Economics]: "The Organization of Activities by APK Management Organs in the New Economic Conditions"]

[Text] In order to attain the 27th CPSU Congress goals for the 12th Five-Year Plan and the longer term, it is necessary to qualitatively change not only the development of agro-industrial production, and its technical level, but also the entire system of management and its organizational and economic mechanism. These are the directions in the CPSU Central Committee and USSR Council of Ministers' decrees: "On Further Improvements in the Management of the Agro-Industrial Complex", and "On Further Improvements in the Economic Mechanism for the Country's Agro-Industrial Complex". As a result, management organizations forming a unified system were set up at all levels of the agro-industrial complex (rayon, oblast, republic, union). This system was simultaneously strengthened by a new economic system for management, with more effective methods for planning agro-industrial production and creating incentives for it based upon the use of progressive methods for self-supporting production [samookupayemost] and self-financing, expanded rights and independence for kolkhozes and sovkhozes and other organizations in the APK and the increased interest and responsibility of labor collectives in the final results of their joint activities.

In spite of the fairly short time which has passed since the formation of the new management system for the APK, a number of positive steps stand out sharply in this complex, especially with regard to increasing the production of grain, meat, milk and other agricultural products. The development of integration between sectors in agro-industrial production is directly tied to restructuring. Thus, in 1986 alone centralized transportation of livestock increased by 26 percent and of milk by 17 percent, waste free and resource saving technologies are being more actively introduced at enterprises in the food and processing industries, the "field - factory" system has started operating more precisely and rapidly, and contractual obligations are more strictly observed.

The agro-industrial complex's investment policies are being restructured. Capital investments are directed towards solving top priority tasks in developing agro-industrial production, processing and storage, the reconstruction and technical retooling of existing enterprises and accelerating the social development of the countryside.

Measures are being actively implemented to equalize economic conditions for operations at kolkhozes and sovkhozes. As a result, there has been some reduction in the number of money losing farms and a huge increase in the number of kolkhozes and sovkhozes with profitability levels close to normal. Cost accounting [khozyaystvennyy raschet] has been strengthened, the finance and credit system improved, economic independence expanded, responsibilities enhanced and conditions created for the development of initiative and socialist entrepreneurialism.

More rational forms and methods for combining centralized management and planning with the granting of extensive rights and full powers to enterprises and organizations have been specified.

At the same time, as analysis shows, the potentials for economic and social growth possessed by the USSR Gosagroprom system are still far from completely utilized.

The activities of APK management organs at all levels can be effectively organized only if the boundaries of the management system itself are precisely defined, its structure substantiated, functions properly distributed among the elements in this structure and a reliable procedure for interaction established.

Management, being a component of production relations, depends upon productive forces and should change as they develop. It should be constantly improved so that at each stage it is appropriate to the specific economic and social conditions of social production. Management forms and methods should not just change only after important advances in the sphere of production, adapting to them, but ahead of time, on the basis of forecasting. Such an approach to constructing a management system is most completely in accordance with its focus on final results. The underestimation of this principle is one of the reasons for management organization lagging behind the functioning of the economic system, and leads to solving partial problems, attaining only approximate effects which might not be the best.

This should be taken into account in objective oriented and planned work in the management apparatus, organized with constant observation of the following conditions: the introduction of the scientific organization of labor at all levels of management; timely provision of complete and reliable information to managers and specialists in the apparatus; making correct, well based management decisions based upon extensive use of mathematical economic methods and computers; organizing systematic control over the implementation of these decisions; constant improvement in management style, form and methods, based on the widespread development of the democratic foundations of management and management psychology, directed towards restructuring the economic thinking of management cadre and their socialist entrepreneurialism.

As is known, a leading role in the APK management system is played by its rayon elements, created in administrative rayons, which are characterized by a great diversity in natural, economic and social conditions.

Taken together, these conditions have a substantial influence upon the organizational-production structure of an APK in a rayon, that is on the composition and relationship between sectors and their organizational forms for production.

Depending upon the depth of specialization and the level of concentration in agriculture and enterprises, organizations and associations in related sectors making up the agro-industrial complex at the rayon level, there are far from equal scales of production operations, which have varying roles in the social division of labor. Thus, some of them have mainly rayon level functions, others primarily represent a sector's interests, etc. Elements in a rayon APK have differing densities of production-economic ties and unequal degrees of technical unity. In the final account all this affects the coordination of enterprises and organizations with rayon and superior organs in agro-industrial complex management.

Thus, the organizational structure of agro-industrial production in administrative rayons varies substantially. As practical experience shows, it is possible to have differing organizational forms for the management of rayon agro-industrial complexes. The rayon agro-industrial association (RAPO), created upon the decision of the May (1982) CPSU Central Committee Plenum, is now the preferred one. Practically all APK enterprises and organizations of rayon importance are directly subordinated to or coordinated with it. Other enterprises and organizations in the APK remain subordinate to their respective superior organizations at the oblast, republic or country-wide level and are not in the RAPO.

Due to the intensifying and deepening integration between APK sectors, a process influenced by scientific and technical progress, in time the RAPO's will include, under conditions of direct subordination, all enterprises and organizations of rayon significance in the APK which are now subordinate to the country's agro-industrial complex (the USSR Ministry of Grain Products, the USSR Ministry of Land Improvement and Water Resources and others). Then, as one of the organizational forms for managing the APK, RAPO will have a more goal directed organizational structure. Enterprises and organizations could then still be subordinated to the rayon APK. In some rayons where the conditions are right, rayon production agro-industrial associations could be set up as unified production-operational and social-economic complexes. In addition to economic-operational functions these associations would also have other functions appropriate to APK state management organs at the rayon level.

Together with RAPO, agro-industrial combines are becoming widespread. Their creation was preceded by the positive experience acquired by the Kuban Agro-Industrial Combine, set up in Timashevskiy Rayon, Krasnodar Kray.

Agro-industrial combines are essentially organizational forms for production and management in the APK. Enterprises and organizations within them make up a single production-operational and social-economic complex. Agro-industrial production consists here of individual elements linked together in a closed production-economic and organizational-technological chain. These elements are enterprises and organizations producing, procuring, processing and selling finished agricultural products.

Agro-industrial combine activities are oriented towards complete independence, based upon the principles of self-supporting production and self-financing. The factors determining their success include, socialist entrepreneurialism in their managers and specialists and high degrees of labor activity among all workers. This is also served by the combines' entire economic mechanism. Fulfilling obligations to deliver agricultural products to all-union and republic stocks, they sell the remaining at their own discretion, at prices which they themselves regulate, based upon the interests of production and consumers. At their own discretion combines improve their organizational-production and management structures and centralize various production and management functions. Financial and accounting centers are examples of this. The liquid money resources of enterprises and organizations in combines are concentrated here. This makes it possible for centers to go to USSR Gosbank as the sole authorities for all financial obligations.

Using the analogy of the combine, solutions are independently found to questions concerning the creation of production, procurement, processing, construction service, trade and other enterprises and organizations.

The agro-industrial combines now being created have a distinctive management apparatus. It is essentially a modification of a similar type of formation. As experience shows, agro-industrial combines based on head enterprises can be another modification. Understandably, this type of formation is subject to extensive production testing.

Other organizational forms for managing a rayon APK can be put to practical use. Attention should be given to the suggestion to organize structural units such as APK management within the executive committees of rayon soviets of workers deputies. Acting as state management organs, these units are obligated to lead all APK enterprises and organizations located in the territory subordinate to a rayon soviet of peoples deputies, independently of their sectoral or departmental subordination. As a rule, APK administrations in rayispolkoms are created in those administrative rayons where the APK's organizational-production structure is mainly comparatively large specialized enterprises and organizations which, in view of their place and role in the social division of labor, organize their activities under the leadership of superior APK management organs. Their functions primarily involve coordinating the activities of enterprises and organizations in the rayon APK. Using the appropriate economic tools of management, they support the planned, proportional and balanced development of agriculture and related sectors in the rayon, rationally use the rayon APK production potential, especially land, water resources and other natural factors, organize production-economic ties between enterprises and organizations which not only represent the APK in the rayon, but also other sectors of the national economy.

From what has been said it follows that various organizational forms and their modifications are possible for rayon APK management. However, no matter what form and modification is accepted for implementation, it is extremely important to properly organize the daily practical activities of their management organs. Above all, this applies to RAPO's now set up in administrative rayons and having quite complex production-operational and social-economic structures. To assure the normal functioning of RAPO's in these conditions it is necessary to bring order into their organizational-production and management structures. This involves eliminating parallelism, duplication and simply excessive elements in production and management, the structure of which in administrative rayons has evolved without the needed combination of sector and territorial organization. An optimal production and management structure should be formed at the rayon level APK making it possible to handle all the tasks it faces with a smaller number of production and management elements.

A large complex of measures must be implemented by the RAPO councils and their apparatuses in bringing order into the organizational-production and management structure of rayon level APK's. Some of them should be especially pointed out.

The agro-industrial complex is and will be individual sectors, the base of which is agriculture. Kolkhozes and sovkhoses are main components of production. There are also industrial type agricultural enterprises: poultry factories and greenhouse combines, etc. The production-agricultural association is viewed as the most promising organizational form in the sector. Each of these should include adjacent kolkhozes (with their agreement) and sovkhoses. This is very important, for it is only if they are territorially adjacent can these farms have an association which is not only a production-operational, but also a social-economic complex.

If it is economically advisable, these associations can be the basis for agro-industrial associations in which agricultural production is integrated with the processing industry. It should be noted that the creation of these associations will permit a 1.5-2 fold reduction in the number of management units directly within the RAPO management apparatus and thus bring to a rational norm the management load now carried by RAPO management.

The organization of production systems on a sectoral and intersectoral level should have a prominent place when improvements are made in a rayon APK production structure.

Sectoral production systems are being created in agriculture. Each of these systems is specialized in the production of just one specific type of agricultural product (wheat, corn, sugar beets, milk, beef, pork, etc). The participants are farms which only supply the type of product for which the system is formed. The system's head enterprise and center can be a progressive farm having high and steady indicators for producing this product, or it can be a scientific institution, scientific-production or production association or interfarm enterprise. This enterprise exercises technological leadership

within the system and provides participants with the necessary services, including consulting on technological questions.

The goal of agricultural production systems is to introduce intensive technology to participating farms and, upon this basis, improve crop yields and animal productivity.

Each intersectoral production system is specialized not only in producing various agricultural products, but also in processing them (for example, milk and milk products). These systems include kolkhozes and sovkhoses, but only for that part of their activities which are directly linked to producing this product, as well as other interested enterprises and organizations in the agro-industrial complex. It is advisable that the main enterprise in the system be a processing enterprise, so that practically all production-economic ties in producing, procuring and selling the product pass through it.

The basic tasks in an intersectoral production system producing, processing and selling milk and dairy products, for example, are:

Organizing a steady raw material base for producing enough milk to supply the milk processing plant;

Developing, in the milk plant's activity zone, large animal husbandry complexes (animal farms) producing milk on an industrial basis;

Creating, at animal husbandry complexes (animal farms), its own feed base to assure the production of enough high quality feeds to completely supply the animals during the stall and pasture periods. Simultaneously, the system forms reserve stocks of feed through their preparation at farms which are members of the system and through producing feed at specially created intersectoral enterprises.

Organizing, at animal husbandry complexes (animal farms), points (shops) for the primary processing of milk, including its cleaning and thorough cooling. These points (shops) are set up on the basis of interfarm cooperation between the kolkhozes and sovkhoses and the milk processing plant;

Receive milk at the point of production and organize its centralized transportation to the milk plant by specialized transport equipment;

Develop and implement measures for the comprehensive use of raw milk and other byproducts, increase the marketability of milk and improve its quality at farms, organize the production of whole milk substitutes and other measures;

Make improvements in contractual relations between the milk plant and kolkhozes and sovkhoses for strengthening material and moral sanctions and incentives for the partners to fulfill their contractual obligations;

Improve economic relationships between the milk plant and kolkhozes and sovkhoses to provide for mutual material interests and responsibility in increasing the production of dairy products, improving their quality and improving efficiency;



Create centralized material incentives funds to stimulate labor collectives in these enterprises. These are to be based upon real labor contributions to producing finished dairy products.

In its activities an intersectoral production system for producing, processing and selling milk and dairy products is guided by the following Statute, specifying rights and obligations:

In management -- full responsibility to the rayispolkom APK administration for the sector's condition and development and operational management of the sector. The rayispolkom is to have the necessary staff of specialists (in this regard, the job description for the rayispolkom APK administration makes no provisions for specialists in this sector); centralization, on the basis of interfarm cooperation, of various management and production-operational functions on a production system scale;

In planning -- substantiation of milk purchase plans given to farms participating in the production system;

In finance and credit -- distribution of state capital investments and credits allocated for the sector's development;

In material-technical supply -- distribution of material-technical resources for the sector;

In construction -- distribution of limits on major construction and contract work, etc.

Such production systems are also being set up for other types of products produced by the APK (for example, for the production of sugar beets and products from their processing, etc).

In addition to bringing order into production structure, extensive work must be done to improve APK organizational structure, especially at the rayon level. The main thing is that at each rayon, and each other level of the APK, there be a complete and well balanced set of management components and their structural subdivisions (departments, groups, executives) making up the entire APK management system at that specific level. At the rayon level, this system consists of RAPO councils and the management apparatus with various types of functional services (economic, agronomic, zootechnical, engineering and others) and temporary collectives created to manage especially important assignments.

In forming the apparatus for the management of the RAPO and its other elements it is above all necessary to have the optimal management structure with the minimum number of people, but capable of successfully solving the entire set of extremely difficult tasks facing the rayon APK. The APK management structure used must be appropriate to production structure, which, as is known, differs everywhere. Consequently, there should not be a formal or stereotyped approach to forming management structure. Nevertheless, one often encounters such approaches. Thus, in the Moldavian SSR RAPO's have the same

structure and number of people, even though many rayons differ markedly with regard to the composition and proportions of sectors and scales of production.

Moreover, in a number of places there are attempts to retain the previous management structure rather than decisively restructure it. In Altay Kray, Voronezh, Volyn, Pskov and a number of other oblasts, together with appropriate units in the agroprom apparatus there are kray and oblast associations for processing agricultural products which, bypassing RAPO's, continue to manage rayon level processing enterprises. Also, in many oblasts the processing, construction and other enterprises and organizations have still not been transferred to the RAPO's.

Substantial improvements are required in the management structure of RAPO's and other USSR Gosagroprom management organs. To improve their efficiency it is advisable to give APK management organs the right to establish the structure, number and job descriptions of management personnel, based upon total sums for maintaining the management apparatus. The conversion of specialists in technical services to a cost accounting basis by signing contracts with farms for management and technical consulting will greatly assist in reducing outlays for maintaining the management apparatus.

In time these technical services could be organized as cost accounting based rayon centers for scientific-technical progress. Specialists at these centers would be entrusted with organizing, on an economic contract basis, the extensive introduction of science, technology and progressive experience and consulting on various agricultural production questions.

There are other circumstances dictating the need and possibilities of organizing such centers. In connection with the forthcoming sizable expansion in the independence of enterprises and organizations in agriculture and other APK sectors, their conversion to self-supporting production and self-financing, there will be substantial changes in the functions now performed by RAPO management. In particular, operational and production-technological functions will be minimized. At the same time RAPO daily activities will be more directed towards improving the level of economic, planning-financial work, the solution of pressing social questions, the exercise of effective control over the activities of enterprises and organizations in the rayon APK. Thanks to such a transformation in the functions of the RAPO management apparatus it will become possible to assign some of the technological services to set up these centers.

The organizational work being done in rayon APK's is a basis for later organizing the activities of agro-industrial complex management. RAPO councils and their apparatus should begin their practical work by writing lists of organizational-operational and social-economic measures to handle the tasks they are facing.

These lists would show the "bottlenecks" for each task and specify the means and methods for their solution, who would be responsible for the work, their rights and powers and work schedules.

RAPO Councils are forming temporary working groups to solve the most difficult questions. These groups are made up of qualified specialists from enterprises and organizations in the RAPO's. This is a characteristic of program-objective management.

RAPO's are working on measures to handle the tasks facing them. These are: the general mastery of zonal systems of crop production, improvements in production-technical support and services to agriculture; strengthening economic relationships between interacting enterprises to stimulate labor collectives, taking into account their real contribution to final results from joint and other activities.

These measures should be implemented only in a creative and searching manner, with one goal -- attaining high final results.

Under the new economic management conditions the practical implementation of measures to be carried out by RAPO's and other management organs in the USSR Gosagroprom system requires a substantial restructuring of the entire organization of management work by managers and specialists in APK management organs and enterprises and organizations. Above all, it is necessary to eliminate unjustified, but firmly rooted forms and methods of bureaucratic management and to radically change the existing clerkish work style. This should be based upon new requirements made upon the agro-industrial complex's management. Essentially, these requirements consist in avoiding petty supervision of managers and specialists at farms, enterprises and organizations, giving them more independence and generally developing their initiative and socialist entrepreneurship.

There should also be a decisive rejection of paper shuffling [bumagotvorchestvo], unnecessary meetings and the implementation of endless measures simply for the sake of formality. It is also necessary to change the content and direction of the work done by various specialists. Their first task now is organizing the introduction of the newest achievements of science, technology and progressive experience. This should be on a strongly planned basis with the appropriate material incentives.

The transition to a new organizational structure for management puts great practical significance upon the precise delineation of rights and responsibilities for each cell in the structure and each level of management, and the allocation of functions to officials. It is also important to avoid a situation in which the same decision can be taken by many people, as a result of which responsibility is fragmented. A situation where a manager is in charge of more subordinate executives than he can supervise cannot be tolerated.

Serious difficulties are created by a situation where a manager is given all necessary rights, but the management structure makes no provision for his responsibilities to superior organs. Also harmful is the other extreme, where a superior organ demands much from lower units, but does not give them independence for effective operational activities and decision making within their competence. This is why the proper ratio between full authority and responsibility, power and control at all levels of management should become an

indispensable condition for the effective functioning of the economic management system in the APK.

The elimination of these shortcomings in management work and giving it new content are top priority tasks for APK management organs. Their solution is directly linked to introducing the scientific organization of labor in management. In general, the scientific organization of labor is to assist in the more effect influence of the management system upon the units being managed. All this can be attained only through the development and introduction of a system of measures which includes: organizing information support, optimizing document flows, rationalizing document circulation, introducing mathematical methods and computers, organizing management apparatus workplaces with the required office equipment, creating normal conditions for work and leisure and a favorable psychological climate in collectives, regulating activities of management workers and stimulating their labor, improving the selection and training of leading cadre and specialists and improving their qualifications.

So, in the entire set of measures examined there are three basic directions in the scientific organization of labor: organizational-economic, information-technical and social-psychological.

Of these directions in APK management activity, the system for information and computer services to management has still not become sufficiently widespread.

The existing system of information-computer services to management organs still is sectoral in nature and is practically absent for the APK and its various levels. Information support to APK management organs is usually based upon the manual processing of information. Computers are only used at the upper levels of management. The insufficient mechanization and automation of information search and processing forces specialists to spend sizable amounts of their time compiling reports and other such documents, to the detriment of management decision making quality.

The appearance of new industrial and intensive technologies, specialization, concentration and growth in production, highly dynamic changes in production assortment, increasingly complex production-technical and economic linkages between enterprises and sectors are all accompanied by steady growth in information, increases in the assortment of documents and the information load per management system worker. The total volume of accounting information for agricultural enterprises in a rayon is now is now 13.5 million indicators.

This spontaneously evolved document flow is characterized by surplus and duplicated information in some areas and shortages in others, and by nonoptimal routes for document flows. There is an increase in the density of information flows and growth in the amount of unused and duplicate information, which is unchanging year after year. Nevertheless, information as a tool [predmet truda] has still not become common to all management services, and computer technology is still used only for primary data processing and solving local tasks. All this results in far from complete use of computers. Therefore they sometimes have no advantages over traditional methods of management.

In order to improve the management system's efficiency it is necessary to make a planned transition to the widespread automation and computerization of management processes.

The automation of management labor will make it possible to separate creative operations in analyzing and making management decisions from the technical operations of collecting, storing, transmitting and processing data. Such data then become part of an information system servicing all units in the management apparatus. As a result, information is converted into a collective tool.

The automation of management creates the prerequisites for new directions in the use of computers -- the computerization of the search for optimal management decisions based upon personal computers. These are combined with centralized automated management systems, making it possible to obtain not only general purpose information, but also to take into account the individual requirements of workers in various services of the management apparatus. Thus, management labor is computerized.

With the introduction of information-computer services into management activity there is a considerable increase in the requirements made on the general standards of management labor and upon the levels of its organization in APK management organs. The transition of these organs to a qualitatively new level of management makes necessary a radical change in the style of leadership, which, as noted at the 27th CPSU Congress, should combine executive ability and discipline with bold initiative; practical and businesslike ways with striving towards large goals and a critical attitude towards shortcomings.

An important factor in this style of work is the development of a democratic basis for management and a simultaneous strengthening of its centralization. Only creative initiative by the masses and labor collectives with a good knowledge of local conditions and features will permit the complete use of all reserves for increasing and improving production.

A democratic spririt in management consists of two mutually linked elements: expanded rights and operational independence for labor collectives at enterprises and organizations, and the use of different forms of involving workers in production management.

The democraticization of management processes presupposes the extensive use of economic tools in the management of agro-industrial production. This above all applies to organizing the activities of labor collectives at kolkhozes, sovkhoses and other enterprises and organizations in the APK on the basis of complete and effective cost accounting, self-supporting production and self-financing. It is also necessary to radically improve all economic work.

The main direction in this work is the discovery and mobilization of internal reserves at farms, increasing agricultural production and lowering production costs.

Many RAPO's have acquired valuable experience in organizing economic work at the appropriate services. Among these one should note: the Mikhaylovskiy RAPO in Volgograd Oblast, the Kominternovskiy RAPO in Odessa Oblast, the Sokulukskiy RAPO in the Kirghiz SSR, the Rezeknenskiy RAPO in the Latvian SSR and others. In all of their multifaceted activities, in which there are no secondary questions, special attention is given to the following: the extensive introduction of collective contracts and intrafarm accounting, capable of activating the human factor; the development of systems of norms needed for substantiated planning of agricultural production on farms and their production units, improvements in production-economic ties between enterprises and organizations in agriculture and related sectors.

Attention should be paid to the Georgian SSR, where units for managing scientific-technical progress have been set up in each RAPO. The introduction of the latest achievements in science, technology and progressive experience is viewed here as an important condition for accelerating the development of agricultural production in administrative rayons.

Interesting experience has been acquired at the Novomoskovskiy RAPO in Tula Oblast, where the main emphasis is placed upon improvements in the use of production potential, integrated on a rayon APK scale. With this goal in mind a set of production-operational, organizational-economic and social measures has been implemented in the association. Realizing these measures made it possible to reduce the resource intensity of production in agriculture by 22.1 percent in 1983-1985 compared to 1980-1982.

The most complete and correct use of the entire arsenal at the disposal of the new management organs to improve their organizational activities will help considerably improve the efficiency of the production potential created in the APK and activate the human factor, thus accelerating the implementation of decisions concerning the reliable food supply for the country made by the 27th CPSU Congress.

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## AGRO-ECONOMICS, POLICY, ORGANIZATION

### REPORT ON ALL-UNION CONFERENCE ON GOSAGROPROM PLANNING

Moscow ZAKUPKI SELSKOKHOZYAYSTVENNYKH PRODUKTOV in Russian No 2, Feb 87 pp 42-43

[Article by S. Pivovarov, scientific secretary, All-Union Scientific Research Institute for Planning and Normatives: "Improving Planning in the USSR Gosagroprom System"]

[Text] An All-Union Conference on improvements in planning the economic and social development of oblast agroproms, rayon agro-industrial associations, enterprises and their units was held in Rostov-On-Don, based upon the All-Union Scientific Research Institute for Planning and Normatives.

The following participated in the conference: managers of economic services at the gosagroproms of union republics, rayon agro-industrial associations, agro-industrial committees in oblasts and krays, autonomous republic gosagroproms and at progressive associations, kolkhozes, sovkhoses and enterprises in APK industries, as well as scientific workers from research institutes in the USSR Gosagroprom system.

The conference was conducted by workers in the Main Administration for the Social and Economic Development of the APK of USSR Gosagroprom. Its goal was to work out recommendations for further improvements in the form and methods for compiling annual and five-year plans for production-financial activities of enterprises, organizations and their units and for rayon agro-industrial associations and oblast agroproms in light of demands made by the 27th CPSU Congress and the decree by the CPSU Central Committee and USSR Council of Ministers "On Further Improvements in the Economic Mechanism in the Country's Agro-Industrial Complex". Participants heard speeches by N. I. Kushnarenko, deputy chairman of the Rostov Oblast Ispolkom and chairman of the Oblast Agro-Industrial Committee; by I. N. Soldatov, director of the All-Union NII for Planning and Normatives of the USSR Gosagroprom. N. V. Averyanov, deputy leader of the Main Administration for Planning and Social Development in the APK of USSR Gosagroprom gave a report entitled "On Tasks in the Improvement of Planning the Economic and Social Development of Enterprises and Organizations, Rayon and Oblast Agro-Industrial Associations in light of the and the decree by the CPSU Central Committee and USSR Council of Ministers 'On Further Improvements in the Economic Mechanism in the Country's Agro-Industrial Complex'".

The following discussed the reports at the plenary session: V. I. Drobot, chief of the Subsection for Planning Methodology, Ukrainian SSR Gosagroprom; S. A. Zubenko, chief economist, Chigirinskiy RAPO, Cherkassy Oblast, E. S. Mashtavichyus, Subdepartment for Planning, Lithuanian SSR; V. F. Bugakov -- department chief, Finance Administration, USSR Gosagroprom; V. V. Pronkin, head of the Economic Laboratory, All-Union NII for Material-Technical Supply, USSR Gosagroprom (Ryazan); R. A. Dubovitskaya -- deputy chairman, Neklinovskiy RAPO, Rostov Oblast; V. S. Tonkovich -- professor, Belorussian State Institute for the National Economy.

The participants' main work was in sections on these themes:

Improvements in planning the economic and social development of agricultural enterprises and their subdivisions;

Main directions in improving the planning of economic and social development of enterprises servicing farms in RAPO.

Based upon the suggestions made at the conference, its participants made recommendations for further improvements in planning the development of enterprises, RAPO and oblast agroproms in the USSR Gosagroprom system. They approved the drafts for annual and five-year plans and the instructions for their compilation developed by the All-Union NII for Planning and Normatives in the USSR Gosagroprom.

Taking the comments into account, it was suggested that the institute elaborate plan documentation and present it to USSR Gosagroprom for approval. It was decided that by 1988, all enterprises, their subdivisions, organizations, rayon agro-industrial associations, agroproms at oblasts, krays and ASSR's be provided with the same standardized documents for current and long term planning in the new economic conditions.

Special attention at the conference was given to questions in improving the normative method for planning state purchases of agricultural products. It was noted that for 1987 and the 12th Five-Year Plan in general, the normative method for planning state purchases has been widely applied in oblasts, krays and rayons of the RSFSR, the Ukrainian, Kirghiz, Moldavian, Kazakh and Uzbek SSR's. This was helped by the 1986 introduction of the new "Methodology for Calculating Control Figures for the Purchase of Agricultural Products". Such figures are given to rayons and farms, based upon normatives taking into account the economic evaluation of land, the availability of fixed productive capital, labor and other resources.

The methodology was worked out by the All-Union NII for Planning and Normatives in the USSR Gosagroprom jointly with other scientific research institutes and approved in June 1986 by USSR Gosplan and USSR Gosagroprom and recommended for widespread use when control figures are assigned for agricultural purchases during the current five-year plan.

In their statements conference participants expressed their opinions on the new methodology, which makes it possible to achieve equally taut purchase



plans taking into account the potentials and prospects for the economic development of agricultural enterprises based upon the intensive use of production resources available and being allocated. For example, in his speech, V. I. Drobot, chief of the Subdepartment for Planning Methodology at Ukrainian SSR Gosagroprom, stressed that during 1987-1990 farms and rayons in the republic will be assigned agricultural purchases on the basis of normatives taking into account their production resources in accordance with the new methodology. However, in his opinion a number of suggestions in this methodology require refinement and need to be made more specific.

Workers in Ukrainian Gosagroprom made corrections for local conditions. As a result it was possible to more precisely determine the resource potential of kolkhozes and sovkhoses in cases where interfarm enterprises' products sales are counted towards fulfillment of participating farms' plans. The resource potential of interfarm enterprises is distributed between participating farms proportionally to output volume sold through their plans. Also, it was suggested that circulating capital include irrigation water used from state irrigation systems.

V. I. Drobot reported some other refinements in the new methodology. In order to more closely link plan targets for purchases with the availability of productive resources, it was suggested that, where advisable, farms and rayons be grouped by natural-economic conditions, specialization and the level of resource potential and that differentiated normatives be worked out for purchases per 1,000 rubles of resource potential. Such a methodological approach will make it possible to give rayons and enterprises better based plans for agricultural product purchases. At Ukrainian SSR Gosagroprom additional tables have been compiled for the Methodological Instructions. These significantly assist in improving the calculations for resource potential and purchase normatives.

Other regions in the country are also creatively applying this methodology, taking local conditions into account. In Kazakhstan an approach to evaluating low productivity pasture land was worked out, while in Krasnodar Kray grain units are used to convert products to comparable magnitudes.

At the conference it was suggested that the new form for agricultural enterprise production-financial plans include special tables to calculate production potentials when assigning state agricultural purchase plans to kolkhozes and sovkhoses and for settling financial accounts with budgets.

At the same time, it was noted that in a number of regions the normative-resource method of planning purchases is not used and that plans for agricultural product purchases during the 12th Five-Year Plan are made in the traditional manner, based on "attainments". There are such cases in the Belorussian, Armenian, Azerbaijan, Georgian, and the Turkmen SSR's and in some oblasts in the Kazakh SSR.

In a number of regions the extensive introduction of the normative-resource method of purchase planning is hindered by the lack of or low quality of land evaluation work on various types of agricultural land, the insufficient experience of some RAPO economic service and planning commission in collecting

and processing initial information on enterprise and rayon resource potential. Also, there is some workers' inertia and lack of desire to get rid of the obsolete method of allocating purchases on the basis of attained levels.

Organizational suggestions were made. Their implementation will help expand the use of the normative-resource method for purchase planning. Thus, many agricultural enterprises and regions need land evaluation work, which, in the immediate future, should be completed by the appropriate organizations.

In the opinion of conference participants, it would be advisable to organize the training of workers in economic services and planning commissions, especially in those regions where the normative-resource method of planning is not utilized. This training should be well organized and scientists enlisted into the work.

Conference participants made recommendations for further improvements in planning the economic and social development of enterprises and their subdivisions, RAPOs and oblast agroproms in the 12th Five-Year Plan. Their implementation will help in restructuring the economic mechanism for operations and in successfully completing the Food Program.

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## REGIONAL DEVELOPMENT

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### RSFSR GOSAGROPROM HEAD ON KOLKHOZ TASKS, APK RESOURCES

Moscow EKONOMIKA SELSKOGO KHOZYAYSTVA in Russian No 2, Feb 87 pp 28-35

[Article by L. Yermin, First Deputy Chairman of the RSFSR Council of Ministers and Chairman of RSFSR Gosagroprom [State Agro-Industrial Committee]: "New Boundaries for Russian Kolkhozes"]

[Text] The workers of the RSFSR's agro-industrial complex, who have joined together to implement the course planned by the party to accelerate social and economic development in the country, have achieved some positive results. The productivity of fields and farms has grown. The production and sale to the state of meat, milk, eggs and wool has increased. However, we must still deal with large-scale and complicated tasks. The main tasks include achieving stable growth in agricultural production in the shortest time possible, dependably supplying food products to the population and raw agricultural materials to industry, and unifying all the efforts of the agro-industrial complex for the purpose of successfully implementing the Food Program.

During the current five-year plan we must increase average annual gross agricultural production volume in the RSFSR as a whole by 15 percent as compared to the 5 percent achieved during the past five-year plan. Thus, the pace of growth must triple. Gross yield of the main product--grain--must be increased to 140 million tons by 1990, an increase by a factor of 1.4 as compared to the average annual level for the last five-year plan. The production of meat, milk and other products must increase considerably. Moreover, this is the minimum needed in order to solve the food problem.

This is why the party is making a priority of accelerating economic and social development and of radically restructuring not just individual aspects but all aspects of economic and social relations within the agro-industrial complex. This includes the improvement of production forces and production relations, the radical reform of administration and management and the transition to qualitatively-new economic growth factors.

"If we intend to achieve serious successes in agro-industrial production," noted M. S. Gorbachev at the June 1986 Plenum of the CPSU Central Committee, "we cannot simply follow traditional paths. Only by concentrating resources, by developing priorities for decisive directions, and by skilfully utilizing

the advantages found in the new economic mechanism and management structure will we be able to act efficiently and to develop production effectively."

The resources we now have available to us are considerable. This is attested to at least by the fact that the cost of fixed production capital in the republic's agro-industrial complex today exceeds 250 billion rubles. This is one-third of all capital available in the national economy. In addition, the material-technical base of the APK [Agro-Industrial Complex] will be strengthened from year to year. On the whole one third of all capital investments allocated for the republic for the 12th Five-Year Plan are being directed into the development of the agro-industrial complex. The total for the years of the five-year plan will exceed 128 billion rubles.

Our strength is also growing immeasurably because the party and government have adopted fundamentally-new measures to improve the economic mechanism of APK management.

Basically, this is a new stage in the development of the entire agro-industrial complex and a new impulse for achieving higher goals. It is very evident that all of these measures have special significance for the continued development of the kolkhoz structure. After all, the essence of restructuring within the agro-industrial complex and the forms of integration are integral to the cooperative form of public production. Here Leninist ideas on cooperation manifest themselves with their full force.

Kolkhozes are making an enormous contribution to food resources. Today they produce almost half the grain, 46 percent of the milk, 31 percent of the meat and most of the sugar beets and sunflowers. They produce close to 40 percent of the total gross agricultural production in the republic. The fate of the Food Program will to a large extent depend on how well kolkhozes perform.

This is the economic side of the matter. But there is also a social and political side. "The kolkhoz as a public form of socialist enterprise," notes the Model Statute, "corresponds fully to our needs as regards the continued development of production forces in the village under the conditions of developed socialism, secures production management by the kolkhoz masses themselves on the basis of kolkhoz democracy and enables us to coordinate the individual interests of kolkhoz farmers with public and national interests. The kolkhoz is the school of communism for the peasantry."

The large role of the kolkhoz is emphasized in the Political Report of the CPSU Central Committee to the 27th party congress, which states directly, "We are for complete clarity on the question of cooperative ownership as well. It has far from exhausted its possibilities in socialist production and in better meeting the needs of people. Many kolkhozes and other cooperative organizations are demonstrating effective operations management."

The party is firmly and systematically carrying out a course to further strengthen kolkhozes and to utilize their possibilities more fully. One of the main tasks of the new village management organs consists of not giving orders to kolkhozes and sovkhozes but of providing them with the most favorable conditions for fruitful work.

As already noted, party efforts, the party's innovative approach to solving urgent problems of the village and the selfless labor of all workers of the republic's agro-industrial complex are already bearing fruit. This is attested to by the preliminary results of the first year of the 12th Five-Year Plan.

The economic situation in the village is also changing for the better. We have noted a tendency toward a decrease in the cost of livestock products as well as of some other types of products. Labor productivity has begun to increase at a more rapid rate, outstripping the growth in wages. In 1986 kolkhozes received about 3 billion rubles of net income from the sale of all types of products. Here total profitability grew by 5 points as compared to the preceding year. The social development of the village has also accelerated.

There have been changes in all links and branches of the agro-industrial complex. Nevertheless, there is no reason to be satisfied about that which has been achieved. The fact is that the current level of production and the per-capita consumption of agricultural products still does not satisfy by far the needs of the population and does not correspond to the increased possibilities of the agro-industrial complex.

In comparison to control figures for the republic's Food Program, the lags that have been tolerated are extensive. The plan was not fulfilled for seven types of basic farming products, including grain, and only 75 percent of the planned quantity of sunflowers was sold. Unfortunately, the kolkhoz sector is also in debt. This debt must be covered, and here we are talking not only about this year's debt but also about the debt that was tolerated during the years of the past five-year plan and it must be covered during the remaining 4 years of the current five-year plan, at which time the Food Program is to be completed.

We should draw serious conclusions from all of this. The most important one, evidently, involves that fact that during the remaining years of the five-year plan it is essential to implement a complex of supplementary measures directed at accelerating social and economic development in the village, at radically improving all production and economic indicators and at eliminating the prolonged lags in the grain industry.

Among these measures work with the land, directed at its effective use and at increasing fertility, should be made a priority.

Kolkhozes have large land areas at their disposal. They have been allocated 88 million hectares of agricultural lands, or over 7,000 hectares per enterprise, for perpetual use. This amounts to 13.5 hectares of arable land alone per kolkhoz farmer. This is an enormous treasure which must be cherished like the apple of one's eye, preserved and increased.

Many enterprises act in this manner. For example, the farmers of Tyumen Oblast have organized things in such a way that the area of arable land increased by almost 100,000 hectares in a relatively short period of time;

moreover, this was accomplished without large expenditures by means of implementing the simplest cultivation and reclamation operations. It is not accidental that the kolkhozes and sovkhoses of this oblast, by utilizing other fertility factors, are increasing gross grain yield from year to year, surpassing plans dealing with sales to the state and expanding the production of animal products. There has been noticeable growth in the area of farmland in the enterprises of Irkutsk, Volgograd and Arkhangelsk oblasts.

Unfortunately, in a number of other oblasts, krais and autonomous republics real concern is not being given to the preservation of land resources. During the past five-year plan alone the area of farmland has decreased by almost 0.5 million hectares in kolkhozes. This refers first and foremost to the enterprises of Ivanovo, Gorkiy, Kirov, Voronezh, Kursk, Tambov, Kuybyshev, Saratov and Ulyanovsk oblasts and the Mari and Tatar ASSR's. For example, the Kirov Oblast executive committee, with the silent agreement of the oblast kolkhoz council, turned to the RSFSR Council of Ministers with a proposal to write off and remove from crop rotation over 100,000 hectares of farmland since they were overgrown with shrubs and scrub forest or were swampy.

Soil erosion brings great losses to agriculture. In the enterprises of the Central Chernozem Region the area of eroded land exceeds 3 million hectares, whereas in the Transvolga Region over half of the arable land has been subject to erosion.

Yet we have acquired valuable experience with regard to land, particularly in Omsk Oblast and Altay Kray as concerns the struggle against wind erosion of soil and in the Chuvash ASSR--against water erosion. The work experience of Leninskaya Iskra Kolkhoz of this republic was approved 1 year ago by the All-Russian Kolkhoz Council.

In addition to eroded soils we have a large number of solonets and acidic soils. All of this of course curtails land resources and decreases land productivity. Many fertile lands are being used for construction, for hydraulic engineering structures and for other projects, sometimes without the necessary justification.

As a result, the area in farmland is decreasing from year to year. This type of decrease has been brought about not only by objective but also by subjective factors--everyone watches as the land become overgrown with shrubs and scrub forests or as it becomes eroded by wind and water and then needs to be removed from crop rotation. Many thousands of hectares of arable land are awaiting recultivation.

The preservation and augmentation of land resources is one aspect of the situation, but there is another no less important aspect. We are speaking about the more efficient use of existing land resources and about increasing their productivity.

In recent years the farmers of most rayons in the republic have come up against a very alarming phenomenon--a drop in soil fertility and a sharp decrease in humus content. Moreover, in some regions this process is becoming threatening because during the last 15 years humus reserves have

decreased to 1.5 percent. This is equivalent to a loss of 450 tons of manure per hectare.

To a large extent this explains the small harvests, the low return on mineral fertilizers, the low quality of production and many other farming problems. A shortage-free humus balance has been retained in just a few oblasts of the Northern and Northwestern regions and in some oblasts of the Central Region in places where large doses of organic fertilizers are applied to the soil.

No matter how much we analyze the work of leading or lagging enterprises and no matter how much we look for the primary reason for the difference in yield there always seems to be a direct relationship between the size of the harvest and the dose of organic fertilizers that is applied.

The well-known kolkhozes imeni Semenov of Tula Oblast, Rossiya of Bryansk Oblast, imeni Kirov of Kalinin Oblast, Bolshevik of Novosibirsk Oblast, imeni Zhdanov of Ulyanovsk Oblast, imeni Dasayev of the Chuvash ASSR and many others can serve as an example of this. The foundation for the success of these enterprises is, once again, concern about a shortage-free humus reserve in the soil and about preserving and increasing soil fertility.

In other words, the humus problem has become the most acute because the size and stability of harvests and the normal functioning of the entire agro-industrial complex will depend upon its solution.

In connection with this it would be appropriate to recall one conceptually important instruction presented in the Political Report of the CPSU Central Committee to the 27th party congress which emphasizes that basic strengths and resources should be concentrated in the most important sections, thereby facilitating the greatest return, especially as regards improving soil fertility and developing stable agricultural management.

Since the solution to the problem of fertility is directly related to organic fertilizer it is essential that we achieve a radical change in the attitude of enterprise directors and specialists toward fertilizer accumulation and use. We must be just as concerned about the production of all types of organic fertilizers as we are about the production of basic field and farm products. We feel that kolkhozes will be capable of achieving the goal of doubling the dose of organic fertilizer applied to the soil already in the near future.

Of course work with land involves not only fertilization but the entire complex of progressive measures indicated in scientifically-based farming systems as well. Unfortunately, not everywhere by far do these systems work for the harvest. This happens because we sometimes find an indifferent attitude towards the land.

Many directors and specialists of enterprises have not yet deeply recognized the spirit of restructuring, and for this reason in their work with land as well as in dealing with many other internal economic questions, they will not take a step without an order from above and do not want to take responsibility upon themselves.

This is also the way many directors and specialists act with regard to their subordinates, whose initiative they paralyze. Of course, under such conditions it is difficult to count on the fact that regular farmers will feel and act like real managers of the land.

Today we have discovered progressive forms of labor organization and reimbursement such as collective contracts and cost accounting, the introduction of which is radically altering the attitude toward land on the part of people who work with it directly.

As we know, there are many paths toward a large and stable harvest. They are mentioned, in particular, in the resolution of the CPSU Central Committee and USSR Council of Ministers, "On Measures to Increase the Stability of the Country's Grain Industry and to Increase Grain Forage Resources During the 12th Five-Year Plan," which gives special attention to the widespread use of intensive technologies.

The fact is that traditional methods of cultivating grains and other crops cannot now satisfy the growing needs of the country for agricultural products or facilitate the achievement of the goals indicated by the Food Program. We need new and more effective methods for producing large harvests and for achieving a large degree of stability in farming.

As the practical experience of recent years has shown, intensive technology is just this type of highly effective method. In 1986 each intensive hectare yielded 8.8 quintals more than a regular hectare. The republic's kolkhozes and sovkhoses have produced almost 13 million tons of additional grain from intensive fields.

How effective intensive technologies can be was demonstrated in 1986 by the practical experience of Ust-Labinskiy Rayon, Krasnodar Kray, which harvested 54.2 quintals of winter wheat per hectare. Rodina Kolkhoz of Omsk Oblast produced 50.2 quintals of winter rye per hectare and Druzhba Kolkhoz of Orenburg Oblast produced 45 quintals of spring wheat per hectare. There are many such examples.

In 1986 net income per hectare of intensive grain crops in the enterprises of Stavropol Kray equalled 144 rubles and the profitability level of grain production reached 83 percent. The kray's kolkhozes and sovkhoses have received an additional 30 million rubles simply for the sale of quality grain, most of which was cultivated according to intensive technology.

The use of intensive technologies for the cultivation of other agricultural crops--potatoes, flax, sunflowers, rape and feed crops--has had a high production and economic effect. These technologies have become prevalent on beet-raising plantations.

The first results of the introduction of intensive technologies have clearly shown their truly revolutionary role in agriculture. With the help of intensive technologies it will be possible to double production on the same piece of land, using the available resources.



But these kinds of results can be achieved only if the complex of measures recommended by science and practice for the highest level of quality farming is strictly adhered to.

Unfortunately, some directors and specialists treat the intensive field in the same way they treat a regular field. They erroneously assume that it suffices to apply large doses of mineral fertilizer and to leave a track. This is a serious fallacy that is costing us too much. For example, in Saratov Oblast the increase from intensive grain fields was only 4 quintals per hectare, and there are rayons and enterprises in which it was only 1.5-2 quintals per hectare. In the republic as a whole we cannot consider the current addition to the harvest per intensive hectare satisfactory. There is one reason for this--low quality farming and gross violations of technology.

Seed farming remains a big problem today. The fact is that even now the proportion of first-class seed does not exceed 20-30 percent. Many areas are still sown in non-regionalized seed varieties, with seed of low reproductions and in seed brought in from other regions.

Grain losses in the course of harvesting are of great concern. The lessons of the past harvest have demonstrated once again that the losses of a cultivated harvest are excessively large due to poor preparation of technology, low productivity, late start-up of harvesting operations, an excessively high load on the grain-harvesting combine and neglect of the drying enterprise. All of this results in a great shortfall in the yield of grain and of other crops.

It is essential to focus the attention of specialists, machine operators and all farmers on the quality with which field work is carried out and to soundly improve the general quality of farming. For this we must organize the preparation, retraining and upgrading of skills for cadres and achieve the goal of having all workers involved in cultivating grains and other crops, especially those working with intensive technologies, act knowledgeably in terms of agrotechnology and economy. This is also important because the area in agricultural crops cultivated according to new progressive technologies will expand every year and already this year will equal 20 million hectares of grain fields alone, and by the end of the five-year plan--31 million hectares.

An analysis of the situation in farming shows that more attention should be paid to valuable crops such as sunflowers, rape and corn.

The production of oil-bearing seed turned out to be the most neglected area of work in the implementation of the Food Program. We clearly are supplying the population inadequately when it comes to vegetable oil. A product which in the past was traditionally an export item has now become one that is in short supply. A solution to the problem will depend on the work of kolkhozes since two-third of the sowing area for sunflowers is found there.

For example, the cultivation of rape will help us considerably in simultaneously dealing with two problems--protein and vegetable oil. We know that for every ton of rape seed it is possible to extract up to 400 kilograms of rape and 600 kilograms of high-protein oil cakes.

The farmers of Lipetsk Oblast have accumulated valuable experience in cultivating spring rape. They produce 15-20 quintals of seed per hectare, including elite seed, on a large area from year to year. In 1986 gross yield here exceeded 16,000 tons. A good rape harvest is produced in many other oblasts, including in the more northern ones.

In order to solve the problem of vegetable oil we should more fully utilize the possibilities of other crops--crown flax, hemp and soybeans--with the goal of fulfilling the plan for the procurement of oil-bearing seed already this year.

Although positive changes have been made in recent years in feed production, many problems remain, and the main one is quality. The poor quality of feeds and a lack of balance in protein explains the fact that despite growth in the procurement of coarse and succulent feeds, the productivity of livestock is growing slowly, and is even decreasing in some places, as for example in kolkhozes of Kalinin and Saratov oblasts and the Mordovian and Chuvash ASSR's.

There are many ways to improve feed quality and to solve the feed problem. Deserving of attention is the fuller utilization of the great possibilities of a universal and highly-productive crop--corn for grain as well as for the production of a grain-stem mass. Specialists have calculated that it would be possible to double production of corn for grain during the next 2-3 years.

As in farming, the basic path toward continued improvements in livestock raising is intensification. Briefly said, the factors of intensification of the branch involve good-quality and balanced feeds, the transformation of the herd in terms of quality, the introduction of progressive organization and wage payments and on the basis of all of this, the overall increase in animal productivity. The attempt to deal with the problem of increasing the production of meat, milk and other animal products by extensive means, solely through the growth of the cattle herd, is not justified at the current stage.

Special attention is required by questions dealing with continued growth of meat production. We know that growth has been achieved in recent years in many rayons by means of hog-raising and poultry farming, primarily utilizing state feeds. The production of beef decreased during the past five-year plan not only because of the poor feed base but also because of serious shortcomings in the organization of raising and fattening of calves. As a result, growth in live weight and the weight quality of livestock remain low and the schedule for raising and fattening the animals stretches out to 2.5 years.

It is essential to expand inter-kolkhoz cooperation everywhere as concerns the fattening and raising of cattle. The republic's Gosagroprom has been assigned the task of increasing beef production by no less than a factor of 1.3-1.4 by the end of the current five-year plan. We must consider this a minimum.

We must make fuller use of the possibilities of a rapidly-maturing branch such as hog raising. Here the main path also involves intensification, an increase in weight gain and a more effective use of the maternal herd.

Increasing milk production remains a no less important problem. A comprehensive program for the intensification of dairy farming has been developed by the republic and approved by the RSFSR Council of Ministers. It foresees increasing average milk yield per cow to 2,650 kilograms and in suburban rayons--to 2,900-3,500 kilograms by the end of the five-year plan with the goal of having each oblast, kray and republic meet its needs for whole-milk products by means of its own production.

For today this is a totally realistic goal. It can be met significantly sooner. This is convincingly demonstrated by 1986 indicators. All that enterprises had to do in order to increase average milk yield per cow by 150 kilograms and to bring it up to almost 2,500 kilograms was to pay more attention to intensive factors, improve the feeding and upkeep of cows, expand collective contracts, and increase organizational work and attention to people. For this reason we can boldly establish a goal for kolkhozes--already this year to reach the target that was planned for the end of the five-year plan by the comprehensive program--2,650 kilograms.

Kolkhoz practice has known large indicators. We can mention the outstanding achievements of livestock farmers in Kolkhoz imeni Lenin of Novomoskovskiy Rayon, Tula Oblast, which is directed by the chairman of the republic's kolkhoz council, V. A. Starodubtsev. In 1986 almost 5,700 kilograms of milk were produced per cow here. Labor expenditures per quintal of production comprise only 1.2 man-hours, and production cost--22 rubles. Each cow provides 1,000 rubles of net income for the kolkhoz.

Improving the economic effectiveness of livestock raising depends to a considerable degree on improving production quality and on curtailing losses during transportation and processing. There are many reserves within the agro-industrial complex for dealing with this very important problem. They include expanding direct ties between enterprises and processing enterprises and making a transition to shipping products out using the vehicles of procurers according to the scheme, "farm--enterprise."

With the creation of agroproms and the RAPO more favorable conditions for this have developed. Based on this, in Arkhangelsk, Vologda, Volgograd, Rostov and other oblasts over 50 percent of the milk and in Belgorod Oblast and Stavropol and Khabarovsk krays almost all farm products are now received locally. An urgent task is to complete the transition to direct ties in all oblasts, krays and autonomous republics in the near future.

Solving the problem of intensification of agricultural production is most closely related to the introduction of collective contracts. It is noteworthy that this progressive method of labor organization and reimbursement originated in our republic, has achieved general recognition and is now being disseminated not only in farming and livestock raising but also in building and in the branches of the processing industry of the APK [Agro-Industrial Complex] as well.

Life and practical experience have convincingly shown that in contract collectives the productivity of agricultural crops and of animals is usually higher and labor expenditures and production costs are significantly lower.

But the matter does not only involve the economic effect. There is another no less important aspect to the question. As a rule, labor and technological discipline and mutual assistance and responsibility in regard to common results are higher in such collectives. This educates people in the spirit of collectivism and expands and deepens socialist democracy and the principles of self-direction.

Collective contracts are most widely used in the kolkhozes of the Bashkir, Tatar and Chuvash autonomous republics, in Stavropol and Krasnodar krays, and in Belgorod, Lipetsk, Orenburg, Ulyanov and Tula oblasts. In the RSFSR as a whole over two-thirds of plowland, one-third of cattle, most of the sheep and poultry and about half of the hogs are being cared for by contract collectives.

According to report data the scope is extensive. However, the return is small. We cannot but see that the practical introduction of collective contracts is not going smoothly everywhere. We still find many errors and miscalculations, a superficial approach and formalism in this important matter.

In many kolkhozes cost accounting assignments are improperly made, often in an untimely manner. There is an absence of a check system of controls and there are no incentives for decreasing expenditures. Sometimes the rights of brigade councils in solving organizational and production problems, in distributing collective wages with a consideration of KTU [Expansion unknown] are infringed upon and contracts are violated, which often leads to the disintegration of contract collectives. Family and individual contracts are being introduced poorly. In some places the path of deception is even being followed--fraudulent additions of the number of contract subdivisions are tolerated and indicators dealing with their work effectiveness are elevated. We must carefully analyze the work results of contract collectives, generalize experience, find and eliminate shortcomings and do everything to make sure that collective contracts become more widely and deeply accepted and truly effective in increasing the productivity of fields and farms and in decreasing production expenditures.

In examining the ways to fulfill the Food Program we must not fail to consider the potential of private plots, which produce one-fourth of our agricultural products. Private plots are basically an extension of public production and are closely tied to it. Meanwhile, in a number of places in recent years private plots have experienced a decrease in production, a drop in the area in potatoes and vegetables and a decrease in the size of the herd, which cannot be recognized as justified.

It is essential to more actively influence the development of the peasant plot and to constantly be aware of these problems. After all, the development of private plots means not only an increase in agricultural production output but also a more effective utilization of labor resources and an improvement in the material well-being of village workers.

One of the principle special characteristics of restructuring is the transition to economic management methods, which presupposes increasing the

level of all economic work in the village. Our party is now giving priority to economic questions.

However, the directors and specialists of a number of kolkhozes and RAPO have turned out to be inadequately prepared for the transition to economic management methods, have a poor grasp of the fine points of an enterprise's economics, underestimate the principles of economy, conservation, counter-expenditure management methods and cost accounting relations, and do not pay attention to production outlays. They may even exhibit dependence. Evidently today as never before in addition to all other forms of interest we need the interest of conscience and citizen's responsibility within each individual as regard the assigned work section and the efficient utilization of material, labor and financial resources.

It is totally apparent that the solution to all problems standing before the kolkhoz in the final analysis depend on cadres and on their competency, battle-readiness, responsibility and political maturity.

A large detachment of experienced and highly productive directors, specialists and cadres of mass professions, capable of solving any problem, has developed in kolkhozes. We must concern ourselves with creating the conditions necessary for creative labor and for allowing workers to demonstrate their initiative and independence. We must issue fewer orders, trust and help workers, and replace fewer management cadres.

Moving away from these principles has a negative effect on the situation. In Kalinin Oblast, for example, almost all kolkhoz chairmen have been replaced at least once during the last 10 years. What did this result in? Agricultural production decreased noticeably during the 10th and 11th five-year plans.

In the republic as a whole in the course of reports and elections in January-February 1986 770 kolkhoz chairmen were replaced, and with a consideration of the replacements in 1985 1,672 chairmen, or one out of every seven, were replaced; and in Ulyanovsk, Saratov and Novgorod oblasts and the Tatar ASSR--one out of four or five. The system of preparing a reserve of kolkhoz chairmen leaves something to be desired, and in some places this system must essentially be started from scratch.

Among the most important problems are the development in each enterprise of stable labor collectives and the strengthening of all sections with trained cadres of the mass professions. Sociological studies show that at present young people put job prestige and labor conditions in first place and that old forms of work do not attract them. This means that we must more energetically continue the work to improve production and social-domestic conditions of village workers, which includes overall mechanization, the expansion of housing construction, the improvement of trade, cultural, domestic and medical services and the development of a dependable transportation network. At the present time a comprehensive program of social restructuring of the village until the year 2000 has been developed in the republic and in every enterprise. It is essential to organize work to unconditionally fulfill it.

It is very important to properly deal with questions of continued development of kolkhoz democracy. The Political Report of the CPSU Central Committee to the 27th party congress notes, "A subject of ongoing concern is that of the steadfast adherence to democratic principles of management of kolkhozes and of other cooperative organizations, the fulfillment of the requirements of their statutes...so that kolkhoz and cooperative self-direction work unfailingly."

The example of the well-known Rodina Kolkhoz of Vologda Oblast, which has been headed for 33 years by M. G. Lobytov, twice awarded the Hero of Socialist Labor, will serve to show how necessary and urgent this type of approach is for increasing the effectiveness of kolkhoz production and the education of kolkhoz farmers. When the SELSKAYA GAZETA correspondent asked Lobytov how it had come to pass that this kolkhoz, which is located in severe northern conditions, operates only according to fives--5 tons of grain per hectare, 5 tons of milk per cow and 5 million rubles of monetary income annually, he answered, "My many years of experience as a chairman convinces me that there is just one path toward this--overall development of kolkhoz democracy. The kolkhoz's main organs are the kolkhoz meeting, the kolkhoz administration and the councils of brigades, farms and other production subdivisions. This includes intra-kolkhoz cost accounting, which runs through all kolkhoz subdivisions, a check system of mutual accounts, collective contracts as the creator of an atmosphere in which the real worker, the active manager of production, feels free and unfettered." Further he added, "We strive to place all factors of kolkhoz democracy at the service of the most important--the restructuring of man's consciousness..."

So this is the source of high production indicators in this kolkhoz. So this is kolkhoz democracy in action!

Unfortunately, recently attention to this important principle of kolkhoz building has weakened noticeably. The problem is that many, disregarding the statute, began to interfere with the operation of kolkhozes, to issue orders, to punish directors and specialists, to take away kolkhoz resources and to ignore democratic forms of management. Sometimes directors of enterprises themselves violate the requirements of the kolkhoz's statute.

There are many cases in which the participation of kolkhoz farmers in managing the enterprise is limited. Doesn't the fact that in 80 percent of kolkhozes fewer than 4 meetings of kolkhoz farmers were conducted in 1985, in 9 percent--only 1-2 meetings speak of this fact? In Novgorod Oblast 50 percent of kolkhozes were like this, and in Ulyanovsk Oblast and the Udmurt ASSR--20 percent. In some enterprises questions that are within the competency of the assembly are decided at meetings of the administration by a narrow circle of individuals or unilaterally. In half the kolkhozes brigade councils are inactive or act formally, with brigade meetings being held from time to time.

In many enterprises the investigating commissions work poorly, without the necessary principle and with a look back at the kolkhoz chairman; they do not find violations of the statute or of Soviet law or shortcomings and negligence in the work of kolkhoz management.

All of this must be decisively corrected. Kolkhoz councils must play an important role here. They are obligated to strictly control adherence to the Model Statute of the kolkhoz, to cut short all encroachments upon its democratic essence, and to radically restructure and increase its role in managing kolkhoz building.

Some are of the opinion that at present the RAPO council has fully taken on the functions of the kolkhoz council. In some places kolkhoz councils have even stopped meeting. This is completely improper.

In connection with the resolution, kolkhoz councils are obligated to hold no fewer than two meetings per year. It is essential to recruit kolkhoz chairmen and the best specialists and leaders of kolkhoz production for preparing for these meetings and to more frequently hold local meetings in rayons and enterprises.

Included in the sphere of activities of kolkhoz councils is work to control the use of budget and centralized resources to improve labor and living conditions and to protect the health of the kolkhoz farmer and his family. Kolkhoz councils are obligated to achieve the correct distribution of these resources and their complete utilization as indicated.

At all stages of socialist building the kolkhoz structure has shown its great vitality. There is no doubt that the kolkhoz peasantry will make its worthy contribution at this turning point stage toward the fulfillment of the 12th five-year plan and toward implementing the strategic party course of acceleration.

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## REGIONAL DEVELOPMENT

### SLYUNOV REPORTS ON BELORUSSIAN AGRICULTURE

For a detailed report from the 27 December 1986 SOVETSKAYA BELORUSSIAY on the speech by N.N. Slyunkov, CPSU Politburo candidate member and first secretary of the Belorussian CPCC, at a 25 December 1986 republic conference in Minsk, see JPRS-UPS-87-016, 10 March 1987, USSR REPORT: POLITICAL AND SOCIOLOGICAL AFFAIRS, pp 23-46. Slyunkov and other speakers at the meeting provide crop harvest and livestock production data, as well as information on the progress of Belorussian agricultural restructuring.

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## LIVESTOCK AND FEED PROCUREMENT

### 1986 MEAT INDUSTRY PRODUCTION ANALYZED, 1987 TASKS NOTED

Moscow MYASNAYA INDUSTRIYA SSSR in Russian No 2, Feb 87 pp 1-5

[Article by A. V. Ignatenko, USSR State Agro-Industrial Committee: "On the Work of the Meat Industry in 1986 and the Tasks for 1987"]

[Text] In the course of implementing the decisions of the 27th CPSU Congress and the June 1986 Plenum of the CPSU Central Committee, the workers of the agro-industrial complex have completed a great deal of work during the first year of the current five-year plan with the goal of fulfilling the Food Program and improving supplies of meat and meat products to the country's population.

By utilizing the advantages of the new form of management within the structure of the agro-industrial complex, the collectives of meat industry enterprises, working in close cooperation with livestock raising enterprises, have succeeded with the 1986 plan according to all basic indexes. The state has procured 19.9 million tons of livestock and poultry, which is 1.5 million tons more than in 1985, and 1,053,000 more than the quota.

On 16 December 1986 the meat industry fulfilled its annual plan for meat production. Above-plan production included 286,900 tons of meat, 73,200 tons of sausage items, 22.4 mub [millions of standard cans] of canned goods and 900 tons of dry animal feeds.

The achieved rate of production growth for most basic types of products surpasses the pace foreseen by the annual plan. In 1986 meat output increased by 7 percent as compared to 1985, sausage items--by 3 percent, semi-processed meat products--by 5 percent and dry animal feeds--by 9 percent. Total production volume increased by 7 percent. Commodity products valued at 426 million rubles were produced above the plan.

The quota for the production of goods of the highest class was overfulfilled. The proportion of sausage items of the highest class comprised 54.3 percent of total production as compared to the quota of 53 percent; canned meats and food rendered fats of the highest quality--72.6 and 63.9, and 85.5 and 84 percent respectively.

Industrial enterprises have implemented measures directed at increasing the effectiveness of using raw materials. By improving techniques, by introducing low-waste technology, by utilizing secondary raw materials (blood, bones, subproducts of category II) for the production of meat products, by expanding the assortment of items produced with the use of animal and vegetable protein, by decreasing losses and by other measures enterprises have been able to increase meat reserves by 532,000 tons. The output of commodity products per ton of processed livestock and poultry increased by 28 rubles as compared to 1985 and now comprises 1,605 rubles.

In the meat industry, labor productivity increased by 6.4 percent as compared to the planned pace of 4.6 percent.

A great deal has been done during the past year to strengthen the material-technical base of the meat industry. Thanks to renovation and technical reequipping of existing meat combines and to the building of new enterprises capacities for meat production have been expanded by 720 tons per shift, refrigeration capacities--by 11,400 tons of storage at one time. The branch's enterprises have been supplied with about 18,000 units of technological equipment worth 29 million rubles, including mechanized flow lines for poultry processing, for the processing of subproducts and intestines, for the rendering of edible fats, for the defatting of bones, and for the production of liver sausages, pelmeni [a type of ravioli] and cutlets; and with automatic machines for producing sausages in artificial casings and sausage meat in a small packaging; and with other modern highly productive equipment.

In the vanguard of the struggle for the successful fulfillment of the first year of the Twelfth Five-Year Plan were the collectives of a number of leading enterprises. Among them were the winners of the All-Union Socialist Competition according to work results for the first to third quarters of 1986--Moscow and Ivano-Frankovskoye production associations, the Pyatigorskiy, Kamensk-Shakhtinskiy, and Tbilisskiy meat combines and others.

Nevertheless, despite the fact that measures have been taken within the agro-industrial complex, the results that have been achieved with regard to the production of meat products are still inadequate to satisfy the demands of the country's population.

By far not all reserves for increasing the production of food products by means of a more thorough overall processing of livestock raw materials will be utilized by the enterprises of the meat industry. In 1986 the meat production quotas were not met by the gosagroproms [agro-industrial committees] of the Uzbek SSR and Estonian SSR; the quotas for sausage items--by the Georgian SSR, the Azerbaijan SSR, the Kirghiz SSR, and the Turkmen SSR; the quotas for semi-processed meats--the RSFSR, the Ukrainian SSR, the Uzbek SSR, the Azerbaijan SSR and the Kirghiz SSR; and the quota for canned meats--the Kirghiz SSR.

An examination and analysis of industrial operations shows that not everything possible is being done yet within the branch to create a dependable barrier to losses at all stages of procurement, shipment and processing of livestock, poultry and meat.

As a result of poor production organization and violations of livestock delivery schedules, Voronezh, Saratov, Volgograd, Gorkiy and Kurgan oblasts of the RSFSR, Poltava, Sumi, Kharkov and Chernovitsy oblasts of the Ukrainian SSR, the Moldavian SSR and the Latvian SSR tolerated cases in which the reception of livestock was held back and processing occurred in an untimely manner.

The quality and assortment of meat products being produced now does not meet current demand. A significant portion of the meat (47 percent of total production) is sold in carcass form without industrial processing. The assortment of sausages does not satisfy the population. Inadequate quantities of thoroughly smoked sausages are produced--3 percent of total production, of semi-smoked sausages--11 percent, of smoked foods--10 percent, of smoked-baked goods--0.7 percent, and of frankfurters and anchovies--12 percent of total production.

Many enterprises are not implementing the thorough, complete processing of poultry. In 1986 only 734,000 tons of poultry meat in eviscerated form were produced, comprising 41 percent of total production; only 30,000 tons of semi-processed and culinary poultry products were produced, comprising 1.7 percent of total poultry meat production.

We have noted many cases in which the meat products that have been produced do not correspond to quality standards. A poor situation regarding product quality has developed in the meat combines of the agroproms of the Kirghiz SSR, the Uzbek SSR, the Turkmen SSR and a number of oblasts of the RSFSR, the Ukrainian SSR and the Belorussian SSR.

Production output is developing slowly as regards packaged and packed products. Many enterprises are not carrying out their assigned tasks as concerns the production of packaging.

In some union and autonomous republics, krays and oblasts existing possibilities are not being utilized by far in order to produce sufficient quantities of foods, which is related to slow restructuring within the agro-industrial complex and lapses in organizational-practical work in economic organs. In order to more fully satisfy the needs of the population for food products workers of the meat industry must maximally use all reserves and possibilities for increasing the production of meat and meat products.

In 1987 state procurement of livestock and poultry is to reach a volume of 19.7 million tons. It is planned to produce 10.4 million tons of meat, 3,202,000 tons of sausage items, 1,757,000 tons of semi-processed meat products, 966 million standard cans of canned meat and 855,000 tons of dry animal feeds.

Labor productivity within the branch must increase by no less than 4.4 percent, and almost all growth must be achieved without increasing the number of workers.

Success in fulfilling 1987 tasks is first and foremost predetermined by the confirmation of new principles and approaches to solving economic and social

problems and to developing in each labor collective a moral climate which will maximally facilitate creative research and the utilization of reserves for continued production growth and for accelerating the transition of the branch toward an intensive path of development.

The most important task for 1987 is the implementation of the restructuring of the work of all links of the agro-industrial complex on the basis of a transition to economic management methods and of the extensive use of scientific and technological achievements. In the work that has to be done it is essential to first secure the positive changes that have been achieved during the first year of the five-year plan and to put into action all existing reserves for further increasing the production of meat and meat products.

While ascribing great significance to well-paced work in the course of the entire year and to increasing the stability of plan tasks, USSR Gosagroprom has demanded from the gosagroproms of union republics a uniform distribution of plan tasks by quarter and month without tolerating dips during the first quarter of the year.

In 1987 the workers of the meat industry must implement a number of cardinal measures directed at the more thorough and complete utilization of animal raw materials for the production of food, medical, feed and industrial products and at decreasing losses at all stages of production, storage and sales.

At the present time work is being completed to develop a draft of a resolution by the USSR Council of Ministers on measures to curtail losses and achieve the preservation of meat and meat products during production, transportation and commerce. It foresees measures to curtail losses of meat and meat products by means of improving the organization of the reception and processing of livestock and poultry, of accelerating the introduction of waste-free technological processes, of intensifying methods for the refrigeration treatment of meat as well as of increasing the responsibility of the collectives of enterprises and transportation organizations for the preservation of meat and meat products during production and shipment.

Ways to decrease meat losses include further improving the existing system of livestock procurement and the introduction of the progressive technique of receiving livestock directly in the enterprise and then shipping out using specialized transportation vehicles. This will enable us to decrease losses and to raise the quality of ready products on the basis of a more precise organization of livestock shipments and of well-paced supplies of raw materials to enterprises.

In order to accelerate the transition to the reception of livestock directly in kolkhozes and sovkhozes, a new standard has been developed and approved and can be found in Gosstandart [State Committee on Standards of the USSR Council of Ministers]. It deals with cattle for slaughter and for beef and enables us to more objectively evaluate the quality of animals when they are received at the place of production. In 1987 extensive work is planned to prepare industry to work according to the new standard.

The gosagroproms of union republics must in a timely manner organize the development and confirmation in the established order of new zonal procurement and intra-republic budgetary prices for livestock and meat as well as norms for the output of meat and products of slaughter for different enterprises.

We must prepare kolkhozes, sovkhoses and meat combines to make the transition to operating according to the new standard. Kolkhozes and sovkhoses must be equipped with scales for weighing cattle individually. In meat combines the weighing and branding sections for carcasses should be reequipped and new branding irons should be made.

A new, single instruction regulating the order for state livestock procurement will be developed in 1987 with the goal of increasing the responsibility of livestock-raising and meat-industry enterprises for adhering to the rules of delivering and receiving livestock and for preserving it.

For meat industry enterprises the most important task is the production of high-quality products. In December 1986 at a meeting of the board of USSR Gosagroprom measures were discussed for radically improving the quality of food products in the light of the requirements of the CPSU Central Committee. The board approved a plan of organizational and technical measures to radically improve the quality of food products in 1987-1990. Measures have been established to strengthen controls over the quality of raw materials and ready products as well as over adherence to technological sanitary-hygienic production conditions, to improve normative-technical documentation with a consideration of the achievements of scientific-technical progress and to equip enterprises with modern equipment, instruments and packaging materials. It is planned to improve forms of material and moral incentives for workers of the agro-industrial complex when they produce high-quality products, and to give priority to this index.

In 1987 the gosagroproms of union republics must take measures to ensure the production of high-quality products. In each enterprise we must establish strict controls over the unwavering adherence to the requirements of normative-technical documentation and to make those guilty of producing low-quality meat products strictly liable, to the point of relieving them of their posts.

Questions of meat quality are closely related to improving the management mechanism. A radical improvement in product quality cannot be achieved without the general introduction of cost accounting and brigade contracts, which will enable us to increase the responsibility of each worker and collective as a whole for the production of high-quality products.

It is essential to deal with questions of improving quality in all its aspects in a systematic and ongoing manner, as required by the CPSU Central Committee.

In order to deal with the task before the branch regarding further increases in the production of food products it is important to find all available reserves for increasing the effectiveness of utilizing animal raw materials, especially secondary resources obtained during the processing of livestock, poultry and meat (blood, bones and subproducts of category II).

In 1987 and subsequent years of the current five-year plan industry must solve the problem of making a transition to producing meat in cut and packaged form. The economic effectiveness of the overall cutting of meats as compared to its sale in carcass form comprises 139 rubles per ton of beef and 445 rubles per ton of pork.

Large reserves exist in the poultry processing branch. The complete processing of poultry increases the volume of marketable items by 154 rubles per ton of live poultry with the production of poultry meat in eviscerated form and by 250 rubles with the production of semi-processed and culinary items as compared to the sale of poultry meat in carcass form.

The output of new types of sausage items and semi-processed meat products enriched with vegetable and animal protein enables us to increase meat resources. The processing of 1 ton of subproducts of category II into meat products increases commodity production by 300 rubles as compared to the sale of these products in non-processed form. The economic effectiveness from the use of animal bone and blood for food purposes equals about 110 rubles per ton of raw materials.

The effectiveness of using bone can be significantly increased by means of introducing the technology that was developed and that is widely used by the meat combines of the Estonian SSR for extracting bone protein and using it in food products. In order to disseminate the experience of the Estonian SSR, general union normative-technical documentation for food bouillon from bone has been confirmed. The 1987 USSR Gosagroprom plan for new technological procedures calls for the output of 700 tons of dry food bouillon with spices and other products using bone protein, which will secure fourfold growth in the volume of production of these products as compared to 1986. By 1990 output is to be increased to 4,000 tons per year. The gosagroproms of union republics and the directors of enterprises must accelerate the creation of the corresponding sections and shops for the production of these products in existing meat combines.

In order to achieve the stable work of meat combines special attention must be given to the refrigeration industry. We must increase refrigeration capacities and the introduction of intensive technologies for the refrigeration treatment of meat because in the final analysis the operations capability of meat combines and the curtailment of losses of products during storage will depend on this.

The output of marketable product per ton of raw material is the general index that reflects the comprehensive and effective use of raw materials and decreases in losses of raw materials. In 1987 the goal is to increase this index by 5 rubles as compared to 1986 and to increase the output of marketable product to 1,610 rubles per ton of livestock and poultry in the branch as a whole.

Agro-industrial committees and all workers of the meat industry must give priority attention to solving these problems. In 1987 socialist competition among branch workers must be focused on this.

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## LIVESTOCK AND FEED PROCUREMENT

### LATVIAN PRIVATE SECTOR LIVESTOCK RAISING LAGS

#### Reasons Examined

Riga SOVETSKAYA LATVIYA in Russian 2 Dec 86 p 2

[Article by A. Timkov, SELSKAYA ZHIZN correspondent: "A Cow On a Balcony"; first paragraph is source introduction]

[Text] Latvian SSR--Last year, the dairy herd in rural yards of Latvia declined by almost 9,000 cows. This represented roughly 10 percent of their overall number on private plots. Why has this happened?

From year to year, improvements have been realized in the living conditions of rural residents and their working conditions have changed for the better. Moreover, the departure of people from rural areas for the cities has declined and in Latvia the rural population is even increasing. Nonetheless, the private herds are declining in size.

There is no point to discussing obstacles or a lack of respect for the owners of cows. To the contrary, the kolkhozes and sovkhoses provide assistance to each individual who has a yard. The reproduction of private cows is included in the general farms systems for carrying out breeding work. There is no problem with regard to acquiring young stock.

During the 30 years in which he served as chairman, Hero of Socialist Labor Yanis Pavlovich Blums, known throughout the republic as a kolkhoz leader, made mistakes only rarely. The Yaunays Komunars Kolkhoz headed by him, a unit which was awarded the "Badge of Honor," has achieved great heights in economic and social development. But the chairman admits he is guilty of one miscalculation. For more than 10 years, enticed by a savings in resources, multiple-apartment three and four-story buildings have been under construction at the kolkhoz. Today the settlement of Kalna, where the central farmstead is located, resembles a city, albeit a small one. The tenor of life for the rural residents has changed: they have ceased developing their yards -- you cannot raise a cow on a balcony. The settlement moved its pastures and haying lands to areas which were two or more kilometers away. And although the new settlers were allocated land beyond the outskirts of the settlement for use as gardens and barns were built for the maintenance of farmyard animals,

nevertheless there were fewer privately owned cows remaining in the village. It became very expensive for the kolkhoz to supply food for everyone from the public farms: distinct from the sovkhoses, it does not have limits for public catering.

It was at this point that the idea was spawned of creating a cooperative on the farm. The kolkhoz made a facility available, it sold hogs and cows and it furnished assistance in procuring feed. The idea was a good one. Of 350 kolkhoz families, 329 joined the cooperative. They jointly owned 27 cows and more than 350 hogs. The cooperative's membership dues support a worker responsible for maintaining the livestock. The kolkhoz members purchase milk and meat at a cooperative store based upon advance orders. Each member of the cooperative can offer for sale surplus products produced on his private plot: apples, berries, eggs, meat, potatoes, vegetables. In addition, the cooperative makes wholesale purchases of vegetables and canned goods at other kolkhozes throughout the republic and at the raypotrebsoyuz [rayon union of consumer cooperatives] -- smoked foods, raisins and other products. Products purchased on the side are sold at a slight mark-up. The money is used to cover the wages of the salesmen.

The entrance into the cooperative of almost all of the kolkhoz members underscores its popularity. The people have milk, meat and other products at their disposal and thus in a sense they are better off than those who maintain livestock on their own private plots. The latter have fresh meat on their tables only following the slaughtering of the animals. The livestock on a private plot tend to require that an individual remain at home. Those who do not have such livestock are free to undertake both distant and short journeys: one out of every two families has an automobile.

Settlements similar to Kalna can be found at every kolkhoz or sovkhos in the republic. The type of construction involved here produces savings in resources: an apartment costs only one half the usual rate and it is erected much more rapidly than a farmstead home. At the Medumi Sovkhos in Daugavpilsskiy Rayon, two apartment buildings, each with 18 apartments, were occupied simultaneously. A majority of the new occupants maintained cows. After some time had passed, only two cows remained for the two buildings. None of the occupants were forced to part with their animals, but the remoteness of the pastures and farm buildings from the housing area had done its work. In Stuchkinskiy Rayon, farmstead homes have been rejected completely during this five-year plan; they are being erected only by private builders.

However, there is still another aspect and one which by no means all of the economists favor. A peasant who has a private plot is well aware of this possibility. He does not remain late in the field or at a farm. The Latvian villages for the most part are not blessed with an abundance of people and thus the leaders prefer workers who do not have private plots. This attitude has long been the rule at the Tervete Kolkhoz in Dobelskiy Rayon. Generally speaking, there are not outbuildings for livestock in the settlement where two thirds of the kolkhoz members live. The villagers have only 6 one-hundredths of a hectare of land for their orchards and gardens. The kolkhoz sells milk and meat to them.



V.A. Gredzens has both supporters and opponents. It is difficult to say which there are more of. But the large farms, those which are well known throughout the republic, do not think well of the private plots. Certainly, not all of the farms are similar to the Tervete, which undertook to supply the villagers with products. Many farms are simply incapable of doing this. At economically weak farms, the fulfillment of plans is associated with achieving success on the private plots. At the Vetslaytsene Kolkhoz in Aluksnenskiy Rayon, for example, the private plots supply one half of the farm's products. Such high effectiveness by the private economy is often achieved by exceeding the norms for livestock maintenance. Six such incidents were uncovered at this same Vetslaytsene Kolkhoz. And they were far from being harmless incidents. Those who praise the private plots and look askance at the public economy are not performing their work well but are merely marking time. For them, the private plots have become the source of their principal income and a considerable amount of income at that -- more than the earnings of a kolkhoz member of sovkhos worker.

Recently, more individuals have come to light who are setting off the private economy against the public economy. Many of them, after selling milk and meat to the state, purchase sour cream, butter and meat in a store. In light of the existing ratio between procurement and retail prices, this offers a twofold advantage. The task of making the private herds conform to the norms for livestock maintenance represents just one more reason for reducing their number.

The farm specialists and leaders and party and soviet workers with whom I held discussions were unanimous in their belief that there must be private plots in the rural areas, but that they must be held to the authorized limits. However, the rural residents themselves are more and more frequently refusing to maintain livestock. The old generation is leaving and their places are being taken over by younger people with other interests and requirements. At the Ayzkraukle Kolkhoz in Stuchkinskiy Rayon, I had an interesting discussion with specialists Yanis Misinsh and Gunar Ratniyek. These two men, both with children, are in the prime of their lives and yet they do not maintain any livestock. They purchase milk from a neighbor, share it with their mothers-in-law and their wives purchase meat and sausage products in the city. The trips and the standing on line are unpleasant events. They could have their own private plots and the kolkhoz would willingly furnish assistance in this regard. Why do they not raise livestock? They both refer to a shortage of time. The summer work day lasts for 12-14 hours and at times even longer. If one has a private plot, then he must choose between his principal work and the private plot. It turned out that almost all of the kolkhoz's chief and middle echelon specialists chose not to maintain cows.

The settlement of Ayzkraukle is located near the rayon center, not far from a railroad and a highway. A trip to the city does not require a great amount of time. The settlement of Markalne in Aluksnenskiy Rayon lacks both an asphalt road and a train and the rayon center is not at all close. But even here, only 15 of 80 new settlers brought in cows. A similar picture prevails at the Koknese Kolkhoz in Stuchkinskiy Rayon, although I met with some animal breeders from a remote farm. Distinct from settlements, the conditions for managing private plots at farmsteads are ideal: pastures and haying lands

located nearby. Everyone maintains young pigs and chickens. But only two of eight families have cows. They purchase milk in a store and do not wish to maintain cows.

Such reasoning as the above is often followed by statements emphasizing the growth in the number of machines in the rural areas and also the high wages. These factors are also serving to dislodge cows from the private plots. The private economy has not forfeited its importance; it still furnishes a considerable portion of the food products. Its status at the present time is by no means a simple one. In those areas where large settlements have been established, it is gradually declining. And for such centers, the experience accumulated in the creation of cooperatives is entirely appropriate. Unfortunately, this experience is not being disseminated to the extent desired. It is an effective method for ensuring that rural workers are supplied with locally produced milk and meat. On farms which I visited, I heard references being made on more than one occasion to difficulties being experienced with the products. In small settlements, the problem of livestock maintenance is resolved in a more simple manner. I am referring to the opinion expressed by the director of the Madliyena Sovkhoz in Ogrskiy Rayon, Candidate of Economic Sciences Yu.A. Belyavniyek.

"The private plots will continue for some time to come. For their continued existence, farmstead type homes must be built and auxiliary settlements developed in the brigades and sections."

Having retained its unpromising villages, the sovkhov protected its private herd. For several years now there has been no reduction in the number of cow, which are being maintained by people who live at some distance from the central settlement. Similar examples can be cited for other rayons and yet the overall tendency is somewhat different -- the cows are decreasing in number.

This is a complicated process and to move it in the proper direction it is not enough to merely furnish assistance to the residents of villages in acquiring young stock or procuring feed for their private livestock. A good knowledge is also required of how best to influence both the public and private herds, so as to be able to take this information into account when developing economic or organizational solutions or developing the rural private plots on a scientific basis. They are still being developed on a spontaneous basis and herein lies the chief reason for the reduction in the number of cows on the republic's private plots.

#### Remedial Party Measures

Moscow SELSKAYA ZHIZN in Russian 1 Mar 87 p 2

[Article by A. Bril, secretary to the Central Committee of the Communist Party of Latvia: "A Cow On a Balcony"]

[Text] The Central Committee of the Communist Party of Latvia has examined the article entitled "A Cow On a Balcony" and considers it to be urgent in nature. Those factors which are delaying the development of the private plots

of citizens and which are bringing about a reduction in the number of livestock, particularly cows, are correctly set forth in it. It is noted that the rayon party, soviet and agricultural organs are still not devoting adequate attention to strengthening the private plots and that they are not attaching proper value to the role they play in augmenting the food resources. The article has been discussed in Gosagroprom [State Agro-Industrial Committee] for the Latvian SSR and in rayon agro-industrial associations.

The Central Committee of the Communist Party of Latvia has decreed that the republic's Gosagroprom, the rayon party committees, rayon executive committees, rayon trade union committees, primary party organizations and kolkhoz and sovkhoz leaders intensify explanatory work among the population and to provide maximum assistance in the management of private plots. The recommendation has been made to have the soviet and economic workers increase the construction of farm installations, create cooperatives, to furnish more assistance to the population in acquiring young livestock and poultry, to provide their owners with haying and pasture land and to provide assistance in procuring feed.

Specific measures have been outlined for improving the procurements of surplus agricultural products produced on private plots. Latpotrebsoyuz [Latvian Republic Union of Consumers' Societies] has been tasked with strengthening the logistical base of the procurement points and launching the construction of enterprises for the processing and storage of agricultural products procured from the population.

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## LIVESTOCK AND FEED PROCUREMENT

### LITHUANIAN CATTLE PROCUREMENT TECHNOLOGY DISCUSSED

Moscow IZVESTIYA in Russian 9 Feb 87 p 2

[Article by L. Kapelyushnyy, IZVESTIYA correspondent: "A Young Bull Purchased On a Farm"]

[Text] Lithuanian SSR--The last path followed by a young bull is a thorny one. He must be transported from a farm to the meat combine in the absence of water and hay and thus the fatal gates represent deliverance for him. And for us it is a penalty. The sufferings of a young bull turn out to be a real loss in meat for us -- meat that was already accepted. And although much has been written about this, no action was taken. Finally, a ray of hope appeared -- the USSR Council of Ministers awarded its annual prize to a group of workers attached to Gosagroprom [State Agro-Industrial Committee] for the Lithuanian SSR for having developed a new livestock procurement technology.

"Our technology is simple. We developed it on the basis of common sense and peasant sharpness" stated one of the prize winners, the chief of the Main Administration for the Production and Processing of Animal Husbandry Products of the republic's Gosagroprom Valentas Stankysvichyus. And he added: "And we did so back in 1967."

Twenty years ago, only 3,000 tons of meat were procured using the new method and last year -- 529,000 tons. In Lithuania, 4 percent of the farms having plans for the sale of meat are not employing the new technology.

The new technology has turned out to be profitable both for kolkhozes and for the processing industry. This is understandable for the kolkhozes. One a month they inform the meat combine regarding what animals and when they will be ready to deliver. On the 20th of each month, the farms are informed regarding just when the transport vehicles will arrive. Within the course of an hour's time, the prepared animals must be weighed and the documents made ready. No escorts, no conflicting situations or other problems -- the young bulls and hogs are accepted by the meat combine based upon live weight. And as the sides of the livestock carried are closed shut, the meat combine accepts complete responsibility for them.

And why for this meat combine? As you can see, it had to create its own service for the shipping of livestock. And indeed specialized motor transport

vehicles Mark KAZ-608 prime movers and ODAZ-385 semi-trailers have been created and are being produced as a punishment not only for the dumb animals but also for active people. The meat combines are forced into having to modify and improve them, despite the fact that they are not being provided with any funds or labor resources for this purpose. Further, where are the receiving personnel? Yes and not just anybody, but rather individuals with a sharp eye and definite skills. They must be provided with special training.

Thereafter, there is the shipping schedule. It must take into account all pertinent factors, since the meat combine for all practical purposes has converted over to "mobile" operations. And herein lies the chief advantage for the processing industry -- rhythmic operations. Do you recall what the leaders of the meat combines had to say when the herd was clamoring at their gates? They maintained that the kolkhozes and sovkhoses delivered their animals to suit themselves. And they had production, a conveyer line, shift operations and discipline on their side.

Each new technology necessarily has an economic effect. In the given instance, it is specific and of interest not only to economists but also to us with you. On 96 percent of the farms, 3,900,000 rubles were spent for transporting livestock. If they had transported them using their own resources, the expenditure of funds would have been greater by 1 million, that is, 4,900,000 rubles.

The freight carrying capability of livestock carriers is twice as great as that of conventional motor vehicles and one livestock carrier can perform the work of four vehicles -- by means of more efficient work.

And perhaps the chief consideration is the need for protecting everything that has been grown. The receiving personnel at meat combines do not accept livestock on the basis of number of tails. They are interested only in a high state of nutrition. In carrying out today's plan, they are guided by no other considerations than the nursing calves. If a young bull is less than 430 kilograms or if a hog is less than a quintal -- they must be fed more. It was by means of this factor that 940 more tons of beef and 1,870 tons more of pork were obtained last year in Lithuania. Do you not remember that if mentioned our mutual gain from use of the new technology? Moreover, in addition to this quantity of almost 3,000 tons of meat, I also had in mind the quality of the meat.

There are one hundred and one reasons why the livestock breeders are not introducing the Lithuanian method. Here there is a shortage of livestock breeders, no garage has been built for them, the roads leading to the farms are not suitable, there is never enough millimeter paper for tracing out the schedule and there is nothing to say concerning the receiving personnel: they require two trips daily! In short, this arrangement is not suitable for all. In Lithuania, they were not forced into this situation -- there was no other solution. The livestock breeders began working in a manner such that the state gates became too narrow for their herd. Last year, 852 quintals of milk and 204 quintals of meat were produced for every 100 hectares of agricultural land. This was not the country's highest indicator; there is room for growth. But if one takes into account the fact that 854 kilograms of milk and 145

kilograms of meat are being produced for each resident of the republic, then these figures no longer appear quite so small.

In conclusion, a word or two concerning the winter. There has been snow and ringing frosts in Lithuania and the railroad was iced over. Everything happened. But an interesting sidelight was the fact that not one meat combine strayed from the schedule.

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## LIVESTOCK AND FEED PROCUREMENT

### CATTLE DISEASE PREVENTION, GENETIC POTENTIAL VIEWED

Kishinev SOVETSKAYA MOLDAVIYA in Russian 26 Feb 87 p 3

[Article by R. Moskalik, head of a laboratory of the Moldavian Scientific Research Institute of Livestock Breeding and Veterinary Science at the Zarya Scientific Production Association and A. Sotskiy, department head of Gosagroprom for the Moldavian SSR: "Relying Upon the System"; first two paragraphs are source introduction]

[Text] The republic's grain growers must carry out a large program of work if they are to raise the annual productivity of the cows to 4,000 kilograms of milk by the end of the current five-year plan. In particular, it is for this purpose that work must be completed in connection with the creation of a herd having a high genetic potential, ensuring the availability of a strong feed base and improving the technological methods.

And certainly, importance is being attached to learning how to manage the branch in the absence of mistakes.

Unfortunately, even the traditional technological methods are violated from time to time. For example, the basic requirements of a shop system for livestock maintenance are not being observed on farms in Lazovskiy, Chernenkovskiy, Strashenskiy and a number of other rayons. At many farms and complexes there is a shortage of interchangeable lying-in sections and dry cows are not being maintained in separate facilities or groups. Work concerned with the creation of shops for preparing non-calving young cows for calving and increasing the milk yields of first heifers is being carried out very slowly. Just as in the past, not enough importance is being attached to the proper raising of replacement young stock at inter-farm enterprises. Last year, at complexes in Sorokskiy, Lazovskiy, Kaushanskiy and other rayons, the average daily weight increase during the raising of heifers was only 276-351 grams. Certainly, given such growth and development conditions, the animals will be unable to realize their genetic potential.

The tasks confronting the branch require new forms for organizing the work and constant contacts between science and production. The republic's zooveterinary service and scientists attached to the Moldavian Scientific Research Institute of Livestock Breeding and Veterinary Science have created various works and they are continuing their search for basic solutions for

organizing branch management. By taking advantage of these recommendations, it is possible, with no special additional expenditures of material or human resources, to achieve considerable improvements in animal husbandry. First of all, a new and progressive technology for the raising and preparation of non-calving young cows for calving must be introduced persistently into operations in all areas.

The essence of this technology at farms and complexes consists of creating specialized shops for the preparation of non-calving young cows for calving and for increasing the milk yields of first heifers. There are already more than 370 such shops in operation throughout the republic at the present time. As a rule, they are being organized alternately on many farms in various facilities and thus they are being referred to as "migrating" shops. They are characterized by one peculiarity: each facility is filled with animals of the same age and calving periods. Thus they are maintained on an isolated basis for an extended period, for a year's time. This makes it possible to carry out an entire complex of zooveterinary and sanitary measures. The additional stresses which the animals were earlier subjected to as a result of movement from one barn to another at the height of the lactation period, which led to a large shortfall in milk on the whole throughout the entire lactation period, were eliminated.

The new technology makes it possible to study better the results of large-scale breeding, during the breeding by stages of the Moldavian type of the black-variegated strain of cattle.

Improvements are being realized in the tending of the animals and in feeding and veterinary services. Advance feeding is being organized for the purpose of uncovering the genetic potential in a first heifer shop and control over milk productivity is being exercised once every 10 days. Such observations are of assistance in eliminating sub-standard cows from the herd in a timely manner.

A serious problem continues to be that of preventing diseases among the animals, particularly leukemia. Today this is the chief hindrance with regard to carrying out measures aimed at improving selection-breeding work. The carrying out of anti-leukemia measures in conformity with the epizootic situation that has developed throughout the republic is aimed at achieving one principal goal: preventing contacts between healthy animals and infected ones during all stages of the technological process. This goal is being achieved through the creation of "migrating shops."

This scientifically sound system of anti-leukemia measures was developed by scientists attached to MoldNIIZhIV [Moldavian Scientific Research Institute of Livestock Breeding and Veterinary Science], taking into account the peculiarities of intensive branch management in Moldavia. It would obviously be better and more convenient to maintain healthy and infected animals separately -- at different farms or sections. But such conditions are not available within the republic and to wait for them to appear would only serve to aggravate an already complicated situation.



Great importance is being attached to the correct carrying out of herd replacement operations. Rejected cows must be replaced only by healthy heifers that are free of the leukemia virus. In this manner the infected animals will be completely removed from the farms in stages.

The new technology is being introduced into operations successfully at the Kolkhoz imeni Michurin in Slobodzeyskiy Rayon. Over a period of 15 years, this farm has sustained great losses caused by leukemia: the density of the animals is very high here and the farm's territory very small.

The separate, isolated raising of 800 heifers, non-calving young cows and first heifers over the past one and a half years has produced fine results. Repeated control checks have confirmed that the animals are healthy. Last year the milk yield from one cow increased by 411 kilograms and reached 4,309 kilograms.

The work being carried out by complexes for the raising of non-calving young cows, which at one time were breeding grounds for leukemia, is deserving of special attention. Today these enterprises must become the chief element in the campaign against diseases and they must supply the farms only with healthy heifers. Towards this end, the animals must be checked for infection once every 6 months.

The carrying out of all of these measures does not require additional material expenditures, but only high executive discipline and the carrying out of the required veterinary and organizational-economic measures. The recommended practice for combating leukemia is not restraining the rates for milk production, but rather it is harmoniously supplementing the technological requirements and furnishing assistance in solving the tasks confronting the branch.

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## MACHINERY, EQUIPMENT

### MAINTENANCE REQUIREMENTS FOR AGRO-INDUSTRIAL COMPLEX

Moscow *TEKHNIKA V SELSKOM KHOZYAYSTVE* in Russian No 1, Jan 87 pp 3-5

[Article by V.I. Fedan, subdivision director of the USSR Gosagroprom [State Agro-Industrial Committee] under the "Put Into Effect the Decisions of the 27th CPSU Congress" rubric: "Maintenance and Repair Base of the Agro-Industrial Complex--At the Level of Contemporary Demands"; first paragraph is *TEKHNIKA V SELSKOM KHOZYAYSTVE* introduction]

[Text] Systematically strengthen the material-technical base of the agro-industrial complex [APK], seek a harmonic development of its sectors, having concentrated its resources in the most important directions of scientific-technical progress....

From the Basic Directions for the Economic and Social Development of the USSR in the Years 1986-1990 and for the Period Through the Year 2000.

The decisions of the 27th CPSU Congress, the April (1985) and June (1986) plenums of the CPSU Central Committee, and Food Program of the USSR provide for a further increase in the efficiency of the utilization of the technological potential accumulated in the agro-industrial complex.

At the present time in the system of the USSR Gosagroprom [State Agro-Industrial Committee], a specialized network of enterprises has been established for the repair of equipment, a system that makes it possible to perform half of the volume of repair work, including the annual repair of 750,000 tractors, more than 2 million motor vehicle, tractor and combine engines, and millions of different assemblies and subassemblies.

The reconditioning of worn-out components is a significant reserve in increasing the supply of spare parts and in saving physical and other resources.

The technical equipment of the APK has reached a level where the restoration of the working capacity of machinery is one of the determining conditions for raising the level of production mechanization.

In their decree "On Measures for a Fundamental Increase in the Quality of Output," the CPSU Central Committee and USSR Council of Ministers specified

the increase in the quality of the repair of agricultural equipment as one of the most important tasks in improving the efficiency of its use. Specialized repair enterprises of the USSR Gosagroprom have worked out and are implementing measures to raise the quality of the repair of equipment that provide for the timely introduction of standardized technical documentation, progressive technological processes for the repair of machinery and the restoration of components, up-to-date technical repair and control and testing equipment, and complex systems for quality control of output, and that also provide for the further specialization and concentration of repair production. As a result of the realization of measures to raise the quality of repair, the average operating time of repaired equipment between repairs at a number of advanced enterprises increased by more than 10 percent and the number of complaints declined by 40 percent.

The results of the control tests of tractors that have undergone major repairs at state machine-testing stations give evidence of the improved quality of repairs. For example, the operating life of the D-50 engines of MTZ-50/52 tractors increased by 23 percent and amounts to 3,280 engine hours and that of the transmissions increased by 61 percent (4,320 engine hours). The operating life of the transmissions of DT-75M tractors increased by 48 percent. The dependability of restored K-701 tractors increased by 20 percent. The volume of repaired tractors and tractor and combine engines certified in the first quality category reached 35 and 48 percent, respectively. The volume of major tractor repairs is declining every year. The specific expenditures for major repairs in the machine and tractor pool of kolkhozes and sovkhozes declined by 31 percent. As a whole, however, the quality level of major repairs remains low. As the results of tests at the machine testing stations of tractors of the main makes that had undergone major repair, the actual operating life ranges from 65 to 94 percent of the standard.

The basic reasons for the lowering of the quality of repairs are the incompleteness of trouble shooting [at 62 percent of the enterprises checked] and control and testing operations [80 percent], the poor quality of washing and cleaning [60 percent] and assembly and regulating work [52 percent], and violations of the technology for the restoration of components [70 percent].

The technical level of repair enterprises is very important in resolving the problem of raising the quality of equipment repairs. In the past 5 years, there was a significant increase in the level of concentration and specialization of production and the structure of fixed capital improved. Particular attention is being paid to the technical reequipping of repair enterprises and to providing them with new washing means and equipment, machine tools for processing chassis and base components, control and regulating stands, and the means of measurement and control.

The successful resolution of the problem of raising the quality of repairs depends to a considerable extent upon the state of the maintenance and repair base. To perform the role of the transmitter of technical progress in the rural areas, the enterprises and organizations of the engineering and technical service of the USSR Gosagroprom must provide for the renovation of their own production and for an increase in the level of its mechanization and automation based on the further development of specialization, concentration

and cooperation, the general utilization of up-to-date equipment, progressive technologies, supplies and instruments, and the broad introduction of robots, manipulators, flexible readjustment systems, up-to-date computer hardware and control systems. Only by being at the forefront of science and technology can the engineering service of the USSR Gosagroprom cope with the tasks set for it.

The technical reequipping of the repair enterprises makes it possible with minimal expenditures to raise labor productivity and the quality of repairs, to increase the volume of output produced in the same areas, to save materials and fuel and energy resources, and to convert enterprises to the repair of new types of machines. The greatest success is achieved in a complex approach, when the entire technological chain is reorganized on a new technical basis. The introduction of separate units of equipment, even the most up-to-date, cannot produce the desired results. In this connection, 28 specialized enterprises of the system of the USSR Gosagroprom are being reequipped on the basis of technical retooling with the participation of machine manufacturing plants. They will be converted to base repair enterprises. It is planned to introduce the achievements of scientific-technical progress there: flexible automated production systems with the application of robotics, machine tools with numeric program control, and automated systems for the control of repair production. It is also planned to train personnel and to disseminate the experience to all repair enterprises.

The further development of the system for the control of the quality of output is provided for by a complex of state standards, "Management of the Production Association and Industrial Enterprise," which is being introduced experimentally at five plants of USSR Gosagroprom.

But the reorganizational work to raise the quality of the repair of equipment is still inadequate. The findings of a departmental check and the complaints of farms indicate that many repair enterprises are violating the requirements of the standards, technical conditions and technology of repairs. It is essential to review each case of repair work of poor quality and to take specific measures on site to eliminate the reasons for defective work.

The rural areas are seeing more and more complex machinery. This is a natural process. There will be more of it in the coming years. Such equipment can be given quality maintenance and in the required volume only with accurate and highly productive up-to-date technical repair equipment and the means of control and testing using microprocessors and complex pneumatic, hydraulic and electronic instruments. It is a complicated matter for kolkhozes and sovkhoses to acquire them and it is not economical to disperse expensive equipment that is in short supply, inasmuch as it will stand idle a significant part of the time because of the small volume of work.

The improvement of equipment aimed at increasing its energy saturation, productivity and universality and at improving the working conditions dictated more complicated designs. Thus, today's tractors are equipped with hydromechanical gear boxes, hydraulic mechanisms for blocking the differential, and hydraulic hitching systems and the harvesting equipment is equipped with hydraulic transmissions, electronic systems for automatic

regulation and control, and the like. The result was the emergence of the problem of the further acceleration of the development of specialized repair production. The USSR Gosagroprom together with the Ministry of Tractor and Agricultural Machine Building and the Ministry of Machine Building for Animal Husbandry and Fodder Production worked out measures to resolve it. The accelerated development of the maintenance and repair base will make it possible to reduce specific expenditures for the maintenance of equipment and to bring them down to 15 percent of the balance value, having ensured the uninterrupted work of the machinery.

The further development of servicing also contributes to improving the utilization of equipment. The basic directions for the development of the maintenance and repair base of agriculture have now been worked out.

It is thus planned to concentrate the major repairs of machinery, assemblies and subassemblies completely at specialized enterprises and current repairs and technical servicing at kolkhozes and sovkhoses and at general workshops as well as at the technical servicing stations of the rayon agro-industrial associations.

In the future, in turn, it is planned to reduce the current repairs on farms primarily to the replacement of defective assemblies and subassemblies with new or restored ones, that is, to the modular repair method, which is now being introduced more and more widely into production. The technical exchange centers issue repaired assemblies, subassemblies and repair batches to kolkhozes and sovkhoses in exchange for worn-out units and payment for the cost of the services. A large reserve for replenishing the exchange stock of subassemblies and assemblies is their utilization from machines that have been written off.

The modular method of repair is very advantageous to farms. It makes it possible to be successful in implementing specialization and concentration of maintenance and repair production, to strive for a larger volume of work with the same capital expenditures, to raise the quality of the work significantly and to lower the production cost. At the same time, it is essential to assign primary importance to the development of the repair of machinery of new makes and, along with the organization of the production of new equipment, to establish a base for its repair. This kind of work is being done on combines of the "Don" type and on other machines.

An urgent matter is the increase in the efficiency of the use of the machine and tractor pool and the technical means of the maintenance and repair base. This requires the universal introduction of the confirmed comprehensive system for the technical maintenance and repair of machinery in agriculture.

Work is continuing on the organization of the centralized repair of the equipment at kolkhoz and sovkhos oil storage facilities and of all of the equipment used in the APK.

The inadequate provision of agriculture with metal-working machine tools is a major restrictive factor in the development of maintenance and repair production.

A large amount of metal is used in the repair production of the APK. This is a unique branch of secondary machine building, where they carry out dismantling, washing, flaw detection, diagnosis, the restoration of the geometric parameters of components and their heat treatment, preliminary assembly, painting and other operations. There is a stock of metal-working machine tools and equipment for this but only 20 percent of it meets current technical requirements. The machine tool building industry is shifting to the production of complex machine tools, machine tools with numeric program control, machining centers and automated lines that cannot be utilized rationally at kolkhozes and sovkhoses. Machine tool repair and machine tool building production has therefore been organized in the system of the USSR Gosagroprom.

The basic objective of this sector is to carry out the repair, modernization and production of metal-working machine tools. Thus, the annual output of screw-cutting lathes at the Astrakhan plant of the RSFSR Gosagroprom will be increased to 6,000 units. The Orshanskiy plant of the Belorussian SSR Gosagroprom is setting up the production of 16K20 lathes.

To improve the quality of major repairs of equipment and the efficiency of repair production, it is essential to fulfill the requirements of the regulations on the technological process in every operation and at every workplace, to apply control and measuring equipment and instruments everywhere, to introduce progressive technologies for washing, flaw detection, painting and testing, and to expand the list of components restored with strengthening. It is necessary to organize the broad introduction of the recommendations worked out by GOSNITI [State Research Technological Institute for the Repair and Operation of the Machine and Tractor Pool] and VNPO [All-Union Scientific Production Association] "Remdetal" for improving the quality of the major repairs of equipment, progressive technological processes, and technological repair equipment and instruments.

An inventory of the maintenance and repair base of the APK is being completed. A special program for quality repairs is being established at every plant and special enterprise. Proceeding from its existence and the need in each region--republic, kray, oblast and rayon--it is essential to have a clear plan for its development in the future and, in carrying out this work, to make broad use of interfarm cooperation and specialization. One must persistently carry out the further concentration and specialization of repair production. It is necessary to concentrate the major repair of machinery and assemblies in prospective specialized enterprises and, using the experience of the Stavropol Kray Agroprom, to establish production associations that will include the entire network of specialized enterprises.

The GOSNITI faces tasks in the conscientious acceleration--with the corresponding scientific and production collectives and in close cooperation with industrial enterprises--of the development of new technological processes and equipment for the repair of combines, tractors and motor vehicles (including with the application of flexible adjustable production systems, industrial robots and manipulators) and absent control and testing equipment (including equipment for the testing of repaired subassemblies and assemblies

under load). It is essential to develop methods in the nonseparated diagnosis of machines for the transition from repairs without personal responsibility to repairs when needed (according to the technical state) and repairs with personal responsibility and to develop and introduce systems of group technologies and equipment for the repair of domestic and imported special and grain-harvesting combines and complex agricultural machinery--systems based on the classification of component parts of machines according to common technological design features and used in the repair of equipment. It is planned to work out a sectorial program "Quality of Repair" and a system for evaluating the reliability of equipment that has undergone major repairs on the basis of accelerated tests at the machine testing stations as well as operational information, to prepare proposals for the expansion of the list of components of repair size and their need for repair production, and to accelerate the development of standard technological processes for the repair of the cabins and rear attachments of series tractors and those of new makes.

They are preparing proposals for the introduction of day-to-day production planning, accounting and an automated control system for specialized enterprises, recommendations on the rational structure of brigades working under a single job authorization with remuneration for final results, and proposals aimed at raising the level of reliability and maintainability of tractors at manufacturing plants.

Primary attention should be paid to the development of repair production for new makes of machinery. In June 1986, the USSR Gosagroprom signed a contract on joint work with the AvtoZIL Production Association for the assimilation of the repair of ZIL trucks equipped with diesel engines. It is planned to prepare proposals on the specification of state standards, technical requirements and other standardizing documentation for major repair of tractors as well as on the revision of the norms for the consumption of spare parts and materials for major repairs.

VNPO "Remdetal" must significantly expand the investigations and studies carried out with the institutes of the USSR Academy of Sciences and, in accordance with the joint program for work in 1986-1987, develop rational technological processes and equipment for the restoration of machine components at base repair enterprises.

For the purpose of the further development of maintenance and repair production, it is necessary to specify the system for the planning of major repairs at specialized enterprises, to accelerate their reequipment through up-to-date machine tools and highly accurate technological instruments, essential cutting and measuring instruments and materials, and, in the very near future, to ensure the release of the full complement of equipment for these purposes. Much work has to be done to increase the release of equipment furnished to the machine yards of kolkhozes and sovkhoses as well as the provision of spare parts to the processing sectors of the APK.

The organization of the timely and high-quality repair of tractors and agricultural machinery, the further specialization of repair enterprises, and the comprehensive resolution of the tasks facing the repair sector by

engineering services will all make possible a significant increase in the efficiency of the use of equipment in agricultural production and the fulfillment of the tasks set by the Food Program of the USSR with good quality and in the optimum time.

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RESERVES FOR INCREASING SUGAR BEET PRODUCTIVITY

Moscow SAKHARNAYA SVEKLA in Russian No 11, Nov 86 pp 14-16

[Article by N.P. Shapoval and V.V. Zacharova, Sugar Beet Research Institute, under "Agricultural Technology" rubric: "Reserves for Increasing Sugar Beet Productivity"]

[Text] The numerous experiments that we carried out over a long period of time were primarily aimed at improving methods in agricultural technology. This includes the determination of the parameters of the density of the stand of plants while avoiding the expenditure of manual labor in its formation, the optimum placement of the plants along the length of the row, the timing of the performance of technological processes (planting of the beets, formation of the stand, and harvest), and their influence on the yield of root crops and technological qualities. In addition, the research involved seeds and means of treating them prior to planting that influence field germination and affect the fullness of the stand of plants, the nature of their distribution and, in the final analysis, the yield, sugar content, and output of sugar per unit of raw material and sowing area. They also studied the influence of differences in variety in combination with agro-technical methods on the indicators of the technological qualities of root crops.

One of the most significant factors determining the high yield of root crops with improved technological qualities is the provision of an optimum density of the stand of plants with their even distribution along the length of the row. Only under these conditions is the fullest use made of the soil fertility, solar energy, moisture and nutritive elements that determine the harvest and its quality.

It is well known that beet plants absorb solar radiation through the surface of the leaves. For this reason, all methods that are elements of the technology for growing beets must be aimed at their intensive growth to optimum size from the first days of the growing cycle and at keeping them in an active state during the course of the entire growing season.

It has been established that for the fullest utilization of the energy of solar radiation it is essential to strive for a rapid increase in the area of the leaf surface and for it to reach 40,000 to 50,000 square meters per hectare as soon as possible. The total area of leaf surface per hectare

depends upon the density of the stand of plants, the amount of fertilizer and water provided, and other factors.

The dissemination of data on the utilization of organic and mineral fertilizers on beets indicates that more is applied every year, therefore increasing the prerequisites for an increase in the leaf surface and an intensification of the photosynthetic activity of the plants, a main factor in the formation of the harvest. As for the provision of the optimum density of the stand, a second and no less important factor in the increase in the area of the leaf surface, it has been the cause of concern in recent years. We have begun to encounter thin beet plantings on many farms, which is the main reason for the low yield of root crops and their low sugar content.

Scientific institutions have determined specific parameters for the density of the stand while taking into account the natural and climatic zones for beet planting. Thus, the density during the harvest period must be 95,000 to 100,000 plants equally distributed in the row in the zone where there is adequate moisture, 85,000 to 90,000 plants where moisture is variable, and 80,000 to 85,000 plants where moisture is inadequate. These are the optimum indicators, under which a uniform plant spacing ensures a favorable system of nourishment, adequate moisture, lighting and high plant productivity.

Practice shows that there is an underestimation of the scientific recommendations with respect to density. In the 11th Five-Year Plan, the average planting density in the Ukrainian SSR was 82,600 plants per hectare, 70,000 in Nikolayevsk and Odessa oblasts, and 80,000 or even less in some years in Volynsk and Odessa oblasts (the latter is in the zone of adequate moisture). These indicators are considerably lower in the RSFSR. The average density of planting in the republic during this period was 66,000 per hectare but it was less than 60,000 plants per hectare in Gorkiy, Penza and Saratov oblasts.

The research that S.A. Chopovskiy carried out in the years 1977 through 1980 at Kolkhoz imeni Petrovskiy in Popelnyanskiy Rayon of Zhitomir Oblast clearly confirms the importance of the density of planting for the yield and sugar content of root crops. Whereas at 82,500 plants per hectare the yield was 40.0 tons per hectare and the sugar content 16.9 percent, it was 48.1 tons and 17.4 percent, respectively, at 110,000 plants. An additional 0.6 tons of sugar per hectare is obtained, with 7.7 tons per hectare collected in the first case. According to the data of the Uladovo-Lyulinetskaya Experimental Station, the increase in the density of the stand from 77,000 to 95,000 plants per hectare increased the yield of root crops by 9.8 tons per hectare, the sugar content by 0.4 percent, the quality of the refined juice by 1.9 percent, the calculated yield of sugar by 1 percent, and reduced sugar losses in molasses by 0.6 percent.

In the zone of inadequate moisture, the increase in the density of the stand of plants is a significant factor in raising the output of white sugar. According to the data of the Kirovograd Oblast Agricultural Experimental Station, the sugar content of root crops at a density of 100,000 plants per hectare was 0.3 to 0.5 percent higher than at 72,000. The calculated yield of sugar increased by 0.4 percent and its losses in molasses declined.

In the experiments of the Belotserkovskaya Experimental Breeding Station, the increase in the density of the stand from 85,000 to 115,000-120,000 plants per hectare resulted in an increase of 0.4 percent in the sugar content of root crops.

Now, when the stand is formed by seeding to final density or by row thinners (automatic and mechanical), the determination of the final density parameters is attaining more and more importance. This has to do with the fact that under the conditions of the mechanization of the process it is impossible to achieve the kind of uniform distribution of the plants that they used to obtain through hand thinning and small loads on beet pickers. To a considerable extent, the level of the yield of root crops and their quality depend upon the indicator of the nonuniformity of the distribution of the plants expressed by the coefficient of the variation of the intervals between them.

Under the mechanized formation of the planting density, there are more plants with closer intervals and there are also more instances when the distances between the plants greatly exceed the allowed distances ("harmful" intervals). Both cases are undesirable in beet plantings. The existence of adjacent plants increases the number of substandard root crops (mass under 100 grams) and their distribution at "harmful" intervals is an indicator of thin plantings with the consequences flowing from this.

The study of the questions of the density of plantings formed by machinery gives reason for the making of refinements made necessary by the exceptionally varied arrangement of the plants and the worsening of their distribution along the length of the row. Thus, according to the data of N.V. Demidovich (1979-1981), in the zone of variable moisture of the Ukrainian USSR, the beet planting density formed by machinery must exceed the recommended density under uniform distribution by 20 to 26 percent and amount to 105,000 to 110,000 plants per hectare.

The experiments of the Umanskiy Agriculture Institute indicate the necessity of ensuring an increased planting density if one does not thereby achieve a good uniformity of the plant distribution. Thus, according to the data of A.A. Yatsenko (1980-1983), the photosynthetic activity of the leaf surface, beginning in the middle of the plant's growing cycle, is significantly greater on denser sowings. In these experiments, with a density of 126,000 plants per hectare and a coefficient of variation of the intervals between plants of 100 percent, the yield of root crops amounted to 49.9 tons per hectare as opposed to 32 tons per hectare with the density 65,000 plants per hectare and the same nonuniformity and 47.0 tons per hectare with 95,000 plants on 1 hectare. It is extremely important to know this for a practical application of the means for the mechanized formation of the planting density and the subsequent elimination of manual labor. Besides increasing the yield of root crops, the provision of a greater planting density per hectare raises, as a rule, the sugar content of root crops by 0.2 to 0.3 percent.

Planting at the optimum time is the second and no less important agro-technical method permitting a higher yield of root crops with a greater sugar

content. Upon it depends not only the duration of the vegetative period but also the level of the field germination of seeds as well as the possibility of ensuring the optimum planting density.

We have accumulated a lot of data confirming the effectiveness of early sowing, when the soil moisture and temperature are optimum. According to the data of the Lgov and Ivanovo experimental breeding stations and the North Caucasus branch of the Sugar Beet Research Institute, delaying sowing by only 1 week relative to the optimum time means losses of 3.7 to 5.4 tons of root crops per hectare and a reduction of 0.3 percent in the sugar content. The advantage of early sowing is especially clear in years with limited amounts of moisture in the fall and winter period. Thus, at the Ivanovo Station, early sowing resulted in the yield of root crops increasing by 8.9 tons per hectare, sugar content by 0.9 percent, and the sugar obtained by 1.8 tons per hectare.

Early sowing is quite effective even in the zone of adequate moisture, where soil moisture is not a limiting factor for sprouting, as in other beet-growing zones. Thus, according to the data of the Uladovo-Lyulinetskaya Station, sowing at the same time as the grain crops (4 April) resulted in an additional 7.1 tons of root crops per hectare when compared with beet sowing on 11 April, that is, each day of delay in sowing results in an average shortfall per hectare of 0.7 tons of root crops and 0.2 tons of sugar.

It has been established that the incomplete harvest and the reduction of the sugar content through delaying the time of the formation of the density of the stand cannot be compensated by increasing the density of the plants. According to the data of the Veselopodolyan Station, a delay of only 2 weeks reduced the yield by 4.9 tons per hectare, the sugar content by 0.7 percent, and the amount of sugar obtained by 1.2 tons per hectare. This is the reason why Salivonkovskiy Selected Seed Growing Sovkhoz ("Chernyshi" Department) obtained 1.5 tons of root crops less per hectare, their sugar content declined by 0.4 percent, and the sugar harvest decreased by 0.44 tons per hectare.

According to the data of S.A. Chopovskiy (1977-1980), on sowings with a density of 97,000 plants per hectare formed in the phase of the first pair of leaves (Kolkhoz imeni Petrovskiy in Popelnyanskiy Rayon of Zhitomir Oblast), they obtained a yield of 50.3 tons per hectare and collected 8.6 tons of sugar per hectare, whereas in a density formed in the phase of four pairs of leaves, even increasing it to 108,000 plants per hectare, the yields were only 47.5 and 8.17 tons, respectively. As has also been shown by experiments conducted under industrial conditions, the periods for the formation of the planting density are an important reserve for raising and improving the quality of the raw material.

Even in the case of thinned sprouts (10 to 12 plants per meter), when there is practically no "confluence" of the plants through their dense stand, delay in the final formation of the density of the stands has a negative effect on the productivity of the beets. This is caused above all by the weediness of the young crops. And the reduction in the beet yield is more noticeable the longer the beet plants are growing along with the weeds.

One of the most important factors in increasing the yield of root crops and in improving their technological qualities is the increase in the growing period achieved by sowing early and shifting the time of the harvest to a later period. The harvesting of beets that have reached technical maturity makes it possible to make the fullest use of the potential possibilities of zoned varieties and hybrids.

In production, it very often happens that they begin harvesting the beets considerably before the indicated time and carry it out at an intensive pace, thereby depriving the beet-sowing farms of a significant part of the harvest and the sugar industry of the receipt of more valuable raw material and an additional yield of sugar per unit of processed output.

Experiments have shown that in August and the beginning of September there is an intensive increase in the mass of root crops and in their sugar content. On the average for the years 1980 through 1985 in the Ukrainian SSR, the mass of root crops increased by 101 grams between 20 August and 20 September and their sugar content increased by 2.6 percent.

In the zone of adequate moisture, according to data covering many years (Uladovo-Lyulinetskaya Station and the Research Institute for Farming and Livestock Raising in the Western Oblasts of the Ukrainian SSR), a shift in the time of the harvest from the first 10 days in September to the second 10 days in October resulted in an additional 7 to 11 tons of roots crops per hectare, in an increase of 0.9 to 2.4 percent in the sugar content, and in an increase in the amount of sugar obtained of 1.7 to 2.5 tons per hectare. Even in years when weather conditions deviate substantially from the normal, the extension of the vegetative period by shifting the time of the beginning of the harvest to a later date is quite effective.

According to the data of experimental institutions, in the first half of September alone the increase in the mass of root crops amounted to 4.4 tons per hectare and sugar increased by 0.7 tons per hectare. In the second half, the corresponding figures were 2.4 and 0.6 tons per hectare. For September as a whole, the mass of roots crops increased by 6.8 tons per hectare and the amount of sugar obtained increased by 1.2 tons.

Research has shown that all beet varieties and hybrids without exception react to a prolongation of the vegetative period through an increase in the mass of root crops and in the sugar content, although the increases obtained are not equivalent.

In speaking of the levels of the yield, sugar content and technological qualities of root crops, it is essential to accentuate in particular the fact that a sharp rise in all of these indicators is achieved through the provision of a complex of factors and consideration of their overall influence. Thus, according to experimental data, the overall influence of factors (use of high-quality seed, ensuring an increased planting density, and extension of the vegetative period by shifting the time of the harvest to the first 10 days in October) increased the yield of root crops by 9.3 tons per hectare, the sugar content by 2.02 percent, the factory output of sugar by 1.84 percent, and the yield of sugar per hectare by 2.1 tons.

The current level of the provision of farms with harvesting and loading equipment and heavy-load transport facilities permits the harvesting of beets through 25 October, the recognized time for the conclusion of the harvest, having started it in the second half of September. This will make it possible to put into effect one of the substantial reserves for raising the yield of root crops and improving their technological qualities.

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## PIPELINE CONSTRUCTION, OPERATION

### METHODS, MODELS FOR FORECASTING FUEL TRANSPORT INDICES

Moscow EKONOMIKA I MATEMATICHESKIYE METODY in Russian No 6, Nov-Dec 86  
pp 1052-1063

[Article by Leonid Yevgenyevich Varshavskiy, candidate in economic sciences, senior scientific associate of VNIKTEP [All-Union Scientific Research Institute of Comprehensive Technical-Economic Indices] at USSR Gosplan: "Methods and Models for Forecasting Fuel-Energy Resource Transport Indices (Using the Example of Gas Pipeline Transport)"]

[Text] The report of Comrade M.S. Gorbachev, General Secretary of the CPSU Central Committee, at the 27th CPSU Congress noted the tremendous importance that the party attaches to the development of the production infrastructure, particularly transport and communications.

At present, transport is one of the most important factors in positioning the production of fuel-energy resources (TER). Their share in the overall volume of freight transport is approximately 50 percent [1, pp 296, 298], and for certain types of TER the transport expenditures exceed the production costs. For example, the relative proportion of the transport component in the expenditures made to obtain gas from the regions of Tyumen Oblast and Central Asia in the center of the European section of the country is 60-75 percent, and for Kuznetsk coal--50-60 percent [2, p 4; 3, pp 24-29]. Over two-thirds of the capital investments in the gas sector and 70 percent of the fixed production capital (OPF) fall to the share of the main gas pipelines [4, p 2]. The proportion of investments in oil pipeline transport in the overall capital investments in the petroleum industry reached 20 percent in 1980 [5, p 37].

In the models for optimization of the development and distribution of the sectors of the fuel-energy complex (TEK), the transport factor is calculated in a separate block, or in the form of the limitations determined by the development of transport, the inclusion of the transport component in the overall expenditures, etc. [6-9]. Most of the models used require quite detailed information on the technical-economic indices (TEP) of the transport systems or parts of them (for example, the TEP of individual pipelines), the expedience of introduction and operation and the productivity of which in the future are determined by optimization. Information on the TEP of certain objects may, however, be lacking, as for example, at the initial stage of working out systems for the development and location of the TEK sectors, as well as for the technical and

economic substantiations (TEO) of the expediency of developing new fuel bases, when the specific transport systems (or parts of them) have not yet been planned, but efficient variants must be outlined for locating the production and consumption of TER.

One of the ways to overcome these difficulties is to use, along with the existing planning information and expert evaluations, unitized econometric models to forecast the TEP of the production and transport of TER. After this forecast and a preliminary estimate of the most effective variants for locating TER production, assignments for planning individual transport systems and building up fuel deposits can be concretely defined, and the development and location of the TEK sectors can be further optimized.

This work, using the example of gas pipeline transport, examines the methodology of econometric forecasting of the dynamics of the key TEP of TER transport, designed for use at the initial stage of working out systems for the development and locating of the TEK sectors, the TEO for developing fuel bases, and also the basic directions in the economic and social development of the TEK sectors. In accordance with this methodology, two stages of forecasting are singled out (see diagram).

At the first stage, an econometric forecast is made of the volume of freight turnover (transport operations), the results of which are the reference for forecasting the volumes of capacities, material resources, capital investments and OPF for most types of transport [10, 11].

The freight turnover volumes are forecast with the aid of the levels, exogenously assigned for the long term, of production and consumption of the type of TER examined in all areas--consumers and producers. The problems of forecasting the regional levels of TER production and consumption are not touched on in this work--we shall note only that forecasting the regional levels of consumption requires information by regions on the development and location of all sectors of the national economy that are consumers of this type of TER. The consumption levels can be calculated on the basis of econometric models or the direct calculation method [12].

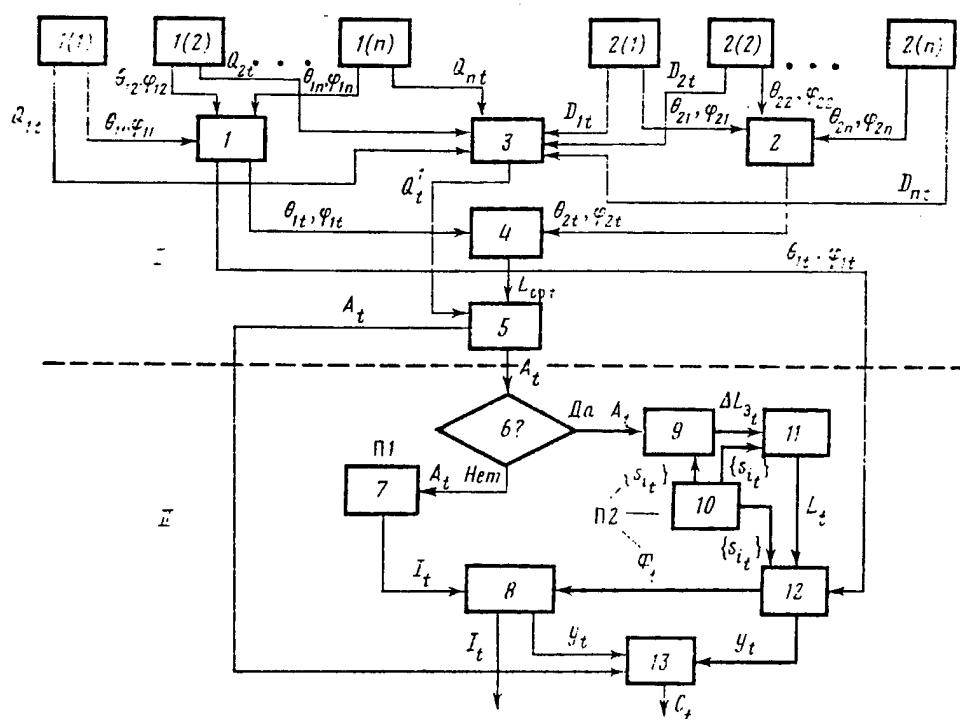
The plans of the extracting and processing enterprises, combined (if necessary) with expert information and econometric models, can be used when determining the long-term regional levels of TER production [13].

We will examine in the work the method of forecasting the freight turnover volumes corresponding to the variant being studied for locating TER production and consumption, which is sufficiently all-purpose and can be applied to individual types of pipeline transport and to railroad transport of coal.

At the second stage, an econometric forecast is made of the volumes of capital investments, the cost of OPF and the operations expenditures. The econometric models worked out for this stage are constructed in consideration of the specificity of pipeline transport, which necessitates drawing in not only economic-statistical, but also reference technical and economic information. At this stage (see diagram), for short- and medium-term forecasting (for 5-7 years),



approach I is used. It is based on the use of the relations that have formed between the generalizing indicators (capital investments, transport operations, OPF). For long-range forecasting, approach II is used, which takes into account the scientific-technical and natural-geographic factors that may change the interrelations established between the indicators in the long-range future (in the diagram the relations between the models in approach I are depicted by thin lines, and in approach II--by thick lines).



1(1), 1(2).....1(n). 2(1), 2(2),..., 2(n) are the geographical coordinates of the centers of extraction and consumption of gas in regions 1,...,n,  $\theta_{ki}, \varphi_{ki} k=1, 2; i=1, \dots, n$ : the volumes of extraction and consumption of gas in regions 1,..., n,  $Q_{it}, D_{it}$ ; 1, 2--are the geographical coordinates of the centers of extraction and consumption of gas in the country  $\theta_{hi}, \varphi_{hi}, h=1, 2$ ; 3--the volume of gas transport  $Q_t$ ; 4--the average distance of the transport  $L_{opt}$ ; 5--the transport operations  $A_t$ ; 6--the calculation of NTP [scientific-technical progress] and the natural and geographic factors; 7 is the model: capital investments  $I_t$ --transport operations  $A_t$ ; 8--the investment-fund model: capital investments  $I_t$ --the cost of the fixed production capital OPF--average yearly  $y_t$  at the beginning of the year-- $\Phi_t$ ; 9 is a model: the increase in length of the main gas pipelines put into operation  $\Delta L_{3t}$ --transport operations  $A_t$ ; 10--the NTP factors (structure of the length of the MP  $\{s_{it}\}$ ) put into operation; 11--the model of the dynamics of the length MP  $L_t$ ; 12--the model of calculating the cost of OPF; 13--the model of calculating the operating expenditures  $C_t$ ; I--is stage I; II is stage II;  $\Pi 1$  is approach 1;  $\Pi 2$  is approach 2

# 1. Econometric Methods of Calculating the Freight Turnover Volume (of Transport Operations)

Direct methods of compiling a reliable forecast of freight turnover volumes often prove to be quite labor-intensive and unsuitable for consolidated pre-plan calculations for the future, since these volumes are determined by the magnitude and direction of the freight flows, the territorial structure of the production and consumption of the goods and the configuration and extent of the transport network. This is particularly characteristic of TER, the consumers of which are territorially dispersed, specifically for natural gas and power-generating coal.

The complexity of direct methods of calculating freight turnover for the future, for example, in gas pipeline transport is also caused by the fact that the Unified System of Gas Supply includes connected gas supply systems with varying productivity and with interrelated functioning programs. Therefore, the pre-plan formulations utilize enlarged forecasts of the freight turnover  $A_t$ , based on determining the volume  $Q_t$  and the average distance  $L_{ep t}$  of the freight transport [14]

$$A_t = Q_t L_{ep t}, \quad (1)$$

where  $t$  is the index for the year of the forecasting period.

Methods of forecasting the average transport distance. Forecasting the average distance of the transport is particularly difficult, as it depends, just as the freight turnover, on a great number of circumstances, among which the most significant are the factors of the location of the production and consumption of the output [15]. The geographical centers of production and consumption, designated by the geographical coordinates of latitude  $\theta_{kt}$  and longitude  $\varphi_{kt}$  ( $k=1$  corresponds to the production of a given product,  $k=2$  to its consumption) may be taken as the characteristics of the distribution [9, 16]

$$\theta_{kt} = \sum_{i=1}^n \theta^{ki} \delta_{kit}, \quad \varphi_{kt} = \sum_{i=1}^n \varphi^{ki} \delta_{kit}, \quad k = 1, 2, \quad (2)$$

$$\delta_{1it} = \frac{Q^{it}}{Q_t}, \quad \delta_{2it} = \frac{D^{it}}{D_t}, \quad Q_t = \sum_{i=1}^n Q^{it}, \quad D_t = \sum_{i=1}^n D^{it}, \quad (3)$$

where  $\theta^{ki}$ ,  $\varphi^{ki}$  are the geographical coordinates of the production and consumption centers for the output in the region  $i$ ;  $Q^{it}$ ,  $D^{it}$  are the volumes of production and demand for the output in the region  $i = 1, \dots, n$ .

Therefore, the average distance of transporting the products is calculated as the function of the geographical coordinates of the centers of their production and consumption, the form and parameters of which can be determined on the basis of a regression analysis [9, 16]. Identification of the regression relations is simplified if the hypothesis is assumed that the average transport distance is the function of the distance between the centers of production and consumption of the products, which is in turn related to the geographical coordinates of the centers of production and consumption by geometrical correlations. For the distance one can, for example, take the length of the chord or arc of circumference, which link the centers of production and consumption.

To link the average transport distance with the geographical coordinates, a single-factor regression dependence of it on the distance  $S_i$  is sufficient. A convenient form for the relation is, for example, the exponential

$$L_{cp,i} = a S_i^b, \quad (4)$$

where  $a$  and  $b$  are the parameters.

As calculations, the values of the distance between the centers of gas extraction and consumption, computed according to various geometrical formulas, differ negligibly from each other (for natural gas the relative deviation for the years of the last four five-year plans was not over 0.5%). As far as the relationship of the average gas transport distance to the distance is concerned, it is characterized with sufficient stability by  $a$  and  $b$ . For example, the estimates of the parameters  $a' = \ln a$  and  $b$ , obtained on the basis of data for 1960-1977, were 1.186 and 0.879. At the same time, the use of more complete information for 1960-1980 led to similar values--1.204 and 0.876 (calculations made in accordance with [3, pp 73, 74, 78; 17, p 2; 18, p 161; 19, p 5]).

The maximum error in forecasts of the average gas transport distance for 1978-1981 for the relation constructed according to selection from the data for 1960-1977 proved to be not over 1% of the value of the average distance, or 15% of its yearly increase, while the error in forecasting for 1981 was practically equal to zero.

Therefore, the method examined for calculating the average transport distance may be used when working out expanded long-range forecasts of the TEP for gas pipeline transport or when estimating the average distance of both pumping oil and petroleum products along pipelines and of railroad transport of coal and other loads, which are conditionally combined into groups of ferrous metals and petroleum cargoes. In the latter cases, however, it is expedient to have a greater breakdown of the products list (coal, steel, rolled metal, with a breakdown by types; motor vehicle gasoline, diesel fuel, mazut, etc.). This detailing is necessary to calculate the effect of specialization and combination of production on the interregional assortment exchange leading to an increase in the average transport distance.

Methods of forecasting the volumes of TER transport. Since part of the TER can be processed or used in the production region, as well as in connection with the possibility of multiple transshipment of fuel goods, the volumes of their transport  $Q_i'$  differ somewhat from the production volumes  $Q_i$ . For example, the inflow of gas in main gas pipelines (this indicator corresponds to the volume of goods transport on other types of transport) in 1980 was equal to 93% of the entire extraction of natural gas in the country [18, p 161]. About 85% of the volume of gas which did not arrive by main gas pipelines, i.e., from  $Q_i - Q_i'$ , falls into two components [19, p 24].

The first of them is the consumption of gas by oil and gas fields for their own needs (for the gas-pumping units of booster compressor stations, gaslift operation of oil wells, etc.), and also for objects of the production infrastructure connected with the development of the oil and gas extraction industry (electric

power plants, boiler houses, construction industry bases, etc.)--  $\Gamma_{11}$  (45% of  $Q_i - Q_i'$  [19, p 24]). In the future, low-pressure gas from deposits that are becoming depleted can, in particular, make up a considerable portion in  $\Gamma_{11}$ . It is more expedient not to transport it along main gas pipelines, but to use it in the extraction region. With expanded calculations, the value of  $\Gamma_{11}$  can be taken as proportional to the oil and gas extraction volumes.

The second component is the gas consumption at gas processing plants--  $\Gamma_{21}$ . In connection with the transition to working deposits with a complex component composition of the gas (the presence of hydrogen sulfide, carbon dioxide) and the need for more complete recovery of the useful components (ethane, propane-butane fractions, casing-head gasoline), the relative proportion of  $\Gamma_{21}$  in the volume of gas not flowing in main gas pipelines is increasing (in 1975, it slightly exceeded 20%, and in 1980 already approached 40% [19, p 24]).

The simplest calculation of  $\Gamma_{21}$  may be made on the basis of data on the composition of the gas going for processing, its volumes and the coefficients of recovering its individual components.

Therefore, when taking account of the large portion of  $\Gamma_{11}$  and  $\Gamma_{21}$  components in the difference  $Q_i - Q_i'$ , in expanded calculations, it may be considered that the volume of gas coming along main gas pipelines is equal to

$$Q_i' = Q_i - \Gamma_{11} - \Gamma_{21}. \quad (5)$$

Methods of forecasting freight turnover volumes. Therefore, the freight turnover volume is

$$A_i = Q_i' a S_i^b (\theta_{11}, \varphi_{11}, \theta_{21}, \varphi_{21}). \quad (6)$$

For some types of TER (coal, oil), the losses during transport are comparatively small. Therefore, it may be considered that the volumes of their production  $Q_i$  and consumption  $D_i$  practically coincide, i.e.,  $Q_i \approx D_i$ . In this case the freight turnover indicators may be quite easily determined in accordance with the methodology set forth. If, however, considerable fuel losses occur during transport, or if it is used in the transport process itself, the calculations become slightly more complex, since the volumes of extraction needed to satisfy the assigned consumption volumes are not known in advance.

As an example, let us study the methodology for determining the transport operations corresponding to the given levels of consumption of gas and its distribution. Consumption of gas to drive the gas-pumping units at compressor stations  $q_{11}$  and its loss in gas pipelines  $q_{21}$  constitute a considerable portion (in 1980 --9% of the volume of gas coming in gas pipelines [19, p 24]. In macroeconomic calculations, these indicators are taken as proportional to the volumes of goods turnover and inflow of gas in gas pipelines

$$q_{11} = c_1 A_i, \quad q_{21} = c_2 Q_i'. \quad (7)$$

In consideration of (6) and (7), the condition of the balance between the consumption and extraction of gas takes the form

$$Q_i = D_i + \left[ Q_i - \sum_j (\Gamma_{1ij} + \Gamma_{2ij}) \right] [c_1 L_{cp\ i}(\theta_{1i}, \varphi_{1i}) + c_2]^*, \quad (8)$$

where  $L_{cp\ i}$  is the function of the coordinates of the centers of extraction (coordinates  $\theta_{2i}, \varphi_{2i}$  of the center of consumption corresponding to the given volumes of consumption are not known). (\*  $D_i$  includes the demand for gas of the sectors of the national economy and export, as well as the difference between the pumping and collection of gas from underground gas storages.)

The balance correlation (8) links the levels of extraction  $Q_{ii}, i=1, \dots, n$ , simultaneously in all the extraction regions, and therefore, variants of extraction can be assigned independently of each other only in  $n-1$  regions. Consequently, before forecasting the transport operations, it is necessary to solve equation (8) in relation to either the extraction volume remaining unassigned in one of the regions or the total extraction volume. After this, the coordinates of the center of extraction may be computed on the basis of (2) and (3) and the value of the average gas transport distance  $L_{cp\ i}$  may be computed (on the basis of (4) and the volume of transport operations  $A_i$  with the aid of (6)).

Let us assume that the extraction levels  $Q_{ii}, i=1, \dots, n-1$  are assigned, and the level of extraction  $Q_{ni}$  in region  $n$  is unknown or, that, equivalently, the overall level of gas extraction is

$$Q_i = Q_{ni} + \sum_{i=1}^{n-1} Q_{ii}.$$

When making the calculations, one of the regions with a reliable raw materials base may conveniently be taken as  $n$ , for example, in the north of Tyumen Oblast, where a considerable part of the all-union gas deposits is concentrated [20].

Let us examine the method of solving the nonlinear equation (8) with relation to  $Q_i$ . For this, we rewrite the variables  $\theta_{1i}, \varphi_{1i}$  in the form

$$\theta_{1i} = \theta_{1n} + (\theta_{1i}^{n-1} - \theta_{1n}) \frac{Q_i^{n-1}}{Q_i}, \quad \varphi_{1i} = \varphi_{1n} + (\varphi_{1i}^{n-1} - \varphi_{1n}) \frac{Q_i^{n-1}}{Q_i}, \quad (9)$$

where  $Q_i^{n-1} = \sum_{i=1}^{n-1} Q_{ii}$  is the total volume of extraction in  $n-1$  regions;  $\theta_{1i}^{n-1}$  and  $\varphi_{1i}^{n-1}$  are the geographical coordinates of the center of total extraction in  $n-1$  regions, determined by analogy with (2) - (3)

$$\theta_{1i}^{n-1} = \frac{\sum_{i=1}^{n-1} \theta_{1i} Q_{ii}}{Q_i^{n-1}}, \quad \varphi_{1i}^{n-1} = \frac{\sum_{i=1}^{n-1} \varphi_{1i} Q_{ii}}{Q_i^{n-1}}.$$

As follows from (8) and (9), when  $\theta_{1n} > \theta_{1t}^{n-1}$ ,  $\varphi_{1n} > \varphi_{1t}^{n-1}$ , the right part of equation (8) is the monotonally increasing function  $f$  of the desired variable  $Q_t$ . In the area of practical interest, the derivative of the function  $f(Q_t)$  is less than a unit, since its fixed point  $Q_t$  (solution (8)) may be found by means of the simplest iterative procedure

$$Q_t^{k+1} = f(Q_t^k), \quad k = 0, 1, \dots,$$

where  $Q_t^k$  is the approximation for the solution (8) in the iteration of  $k$ .

As the calculations show, a solution with acceptable accuracy (up to 0.1%) is reached in 3-5 iterations. After determining the desired volumes of extraction  $Q_t$ ,  $Q_{nt}$ , necessary to satisfy the exogenically assigned levels of demand  $D_{it}$ ,  $i=1, \dots, n$ ,  $D_t$ , the values of the variables  $\theta_{1t}$ ,  $\varphi_{1t}$ ,  $L_{cp\ t}$ ,  $A_t$ ,  $q_{1t}$ ,  $q_{2t}$  may be found.

The method discussed was used to forecast the volumes of transport operations and the average gas transport distance in the country. The forecasts proved to be quite close to the results [21] obtained on the basis of detailed calculations (the maximum deviation was only 1.7%).

## 2. Econometric Methods of Forecasting Capital Investments, OPF and Operating Expenditures

Freight turnover is the original indicator for most of the methods of expanded macroeconomic calculation of the volumes of capital investments in transport and fixed production capital (OPF) for the future [10, 11]. These key indicators of economic development may, in part, be determined either on the basis of various modifications of the production functions or by calculating the capacities corresponding to the given volumes of freight turnover\* or else by means of the indicator of incremental capital intensiveness for the growth of freight turnover [11]). (\* This method is extended in establishing the need for rolling stock capacities in railroad transport and in the fleet [11].) Regardless of the principal system for predicting capital investments and OPF, allowance must be made in the calculations for the dynamics of converting capital investments into OPF and production capacities, the dynamics of developing the OPF and capacities introduced, the factors of scientific-technical progress and natural-geographical factors.

The lower part of the diagram gave two possible approaches to econometric forecasting of capital investments, OPF and operations expenditures in gas pipeline transport (stage II).

The first approach to determining these indicators lies in using the unitized dynamic interrelationship between capital investments and the effect caused by them (growth of transport operations) in the form of time lags [9], models of the dynamics of OPF and models of the dynamics of operations expenditures. We will examine the models used in this case as component units.

The model "capital investments--the growth of transport operations." Capital investments give the full effect in the form of the growth of transport operations not immediately, but only upon completion of the entire complex of the

interrelated SMR and process of development. For example, in gas pipeline transport, the full effect is achieved, not at the moment of introducing the line structures, which have a share of 70-75% of the capital investments in gas pipeline construction [3, p 203], but only after introduction of all the planned compressor plants. The lags between capital investments in the construction of the gas pipelines  $I_t$  and the increase in transport operations are well described as time lags of the first order [9]

$$\Delta A_t = \frac{\alpha}{1 - \lambda z^{-1}} I_t, \quad (10)$$

where  $z^{-1}$  is the operator of the time lag, i.e.,  $z^{-1} \Delta A_t = \Delta A_{t-1}$ .

As the calculations for the country's gas pipeline transport show, the estimates of the parameter  $\lambda$ , obtained on the basis of data in various periods (1966-1976, 1968-1978, 1970-1980 [3, p 56; 18, p 161; 22, table 4]), practically coincide and are equal to 0.65. The average lag between the capital investments for the construction of gas pipelines and the effects in the form of an increase in transport operations, computed according to the formula  $T = 0.5 + \lambda / (1 - \lambda)$ , is approximately 2.5 years. At the same time, the values, calculated from information in the same time periods, of the parameter  $\alpha$ , which characterizes the incremental capital return in the year when the capital investments were made (calculated for the growth of transport operations) are equal to 12-13  $\frac{\text{bill. m}^3/\text{km}}{\text{mill. rubles}}$ .

The stability of the estimates of the parameter  $\lambda$ , reflecting the dynamics of the interrelation, makes it possible to use them in long-range calculations. As for  $\chi$ , its value is determined by the natural-geographical conditions (transfer of construction to the regions of the North), as well as by factors of scientific-technical progress (at present, one of the most important is increasing the diameter of the pipelines put into operation). Carrying out measures such as increasing the proportion of gas pipelines 1420 mm in diameter, calculated for a pressure of 75 atm., in the structure of the gas pipelines being constructed and put into operation, as well as a fortunate choice of the routes for the gas pipelines (along developed corridors and those being developed), makes it possible, now and in the near future, to compensate to a considerable extent for the effect of natural-geographical factors on a reduction in the coefficient  $\alpha$ . This provides a basis for using model (10) in short- and medium-range forecasting (for 5-7 years). The volumes of transport operations determined in accordance with the methodology examined in Section 1 are the initial ones for the calculations.

Model of the dynamics of OPF. The cost of OPF is calculated after the volumes of capital investments have been established on the basis of the following model

$$\Phi_t = \Phi_{t-1} + v_{1t} + v_{2t} - w_{1t} - w_{2t}, \quad (11)$$

$$HC_t = HC_{t-1} - v_{1t} + (1-s)I_t, \quad (12)$$

$$v_{1t} = \alpha_1 HC_{t-1} + \beta_1 (1-s)I_t, \quad (13)$$

$$w_{it} = \mu w_{it-1} + \gamma(1-\mu)\Phi_{t-1}, \quad (14)$$

$$y_t = (1-\nu)\Phi_t + \nu\Phi_{t-1}, \quad (15)$$

where  $\Phi_t$ ,  $HC_t$  — the cost of OPF and the volume of unfinished construction at the end of the year  $t$ ;  $v_{1t}$  is the cost of the new OPF introduced;  $v_{2t}$  is the cost of the OPF arriving from other organizations;  $w_{1t}$  is the cost of OPF withdrawn as the result of liquidation and wear;  $w_{2t}$  is the cost of OPF turned over free of charge by other organizations;  $y_t$  is the average yearly cost of OPF;  $\nu$  is the averaging coefficient ( $\nu = 0.35$  [23]);  $s$  is the portion of capital investments not forming fixed capital.

The correlations (11) and (12) describe the change in value of the OPF and in the volumes of uncompleted construction; (13), in combination with (12) characterizes the dynamics of the volumes of introduction of new OPF and uncompleted construction. It is not difficult to show that (12) and (13) may be reduced to the distributed time lag\*

$$v_{1t} = \frac{\beta_1 + (\alpha_1 - \beta_1)z^{-1}}{1 - (1 - \alpha_1)z^{-1}} sI_t, \quad (16)$$

for which the average value of the construction lag equals  $T_{crp} = 0.5 + (1 - \beta_1)/\alpha_1$ . (\* With zero initial conditions in (12), i.e., when  $HC_0 = 0$ .) As the calculations show, the estimates of the parameters  $\alpha_1$  and  $\beta_1$  are 0.71 and 0.38, i.e., the average value of the construction lag in building gas pipelines is about 1.5 years, which corresponds to the actual construction periods.

Equation (14) describes the process of withdrawing OPF from use as the result of its liquidation and wear. Its form shows that with a fixed price for the OPF, the value of the OPF being withdrawn from use increases in time, and the coefficient of withdrawal reaches  $\gamma$ . Considering the fact that the weighted mean normative periods of service for line projects, to which 70-75% of the cost of the OPF falls, is 33 years, and for compressor plants—17 years [24], it may be assumed that  $\gamma = 0.033$ , and in this case  $\mu = 0.982$ . The correlation (15) establishes the connection between the value of OPF at the end of the year and its average yearly value.

The exogenic variables in calculating the dynamics of the OPF according to the approach examined are the volumes of capital investments  $I_t$  and the indicators  $v_{2t}$ ,  $w_{2t}$ , characterizing the redistribution of the capital between the gas transport subsector and other organizations. In expanded calculations, extrapolation methods of forecasting the indicators  $v_{2t}$ ,  $w_{2t}$  may be used [4].

Model of the dynamics of operational expenditures. After the average yearly cost of OPF is calculated, a forecast of the operational expenditures for transport can be made. In view of the large relative proportion of depreciation in the cost of transport (in gas pipeline transport its share is over 50% of the cost of gas transport [3, p 26]), in expanded forecasts of operating expenditures for gas transport it is expedient to single out two components: depreciation allowances  $C_{at}$ , depending on the average yearly cost of the OPF  $y_t$ , and the



sum of the other expenditures  $C_{np,t}$  (energy, wages, outlays for materials, etc.), determined mainly by the volume of transport operations  $A_t$ .

As the calculations have shown, the dynamics of these constituent operating expenditures are well described by the regressional correlations

$$C_{at} = 31y_t^{1,162}, C_{np,t} = 0,826A_t^{1,046}, \quad (17)$$

where  $C_{at}$  and  $C_{np,t}$  are in million rubles;  $y_t$  is in billion rubles;  $A_t$  is in trillion  $m^3/km$ . The results of the forecast of operating expenditures and the cost of gas transport, made on the basis of (17), proved to be quite close to the values of these indicators obtained by the direct calculation method (maximum deviation did not exceed 2%).

In completing the examination of the first approach to forecasting the TEP of gas pipeline transport, we will indicate the order of calculating the indicators. Initially, according to the volumes of transport operations  $A_t$ , and their increases  $\Delta A_t$ , determined at stage I (exogenous variables at stage II), the volumes of capital investments  $I_t$  are calculated on the basis of (10). Then, with the aid of a model of the dynamics of OPF (12)–(15), the average yearly cost of the OPF— $y_t$ , is calculated, and, using (17)—the operating expenditures for transport.

The second approach to econometric forecasting of the transport TEP is expedient when making calculations for the long-range future.

To forecast the cost of the OPF and the extent of the MG [main gas pipelines], we use the model

$$\Phi_t/L_t = 20,4 + 221,2h_t \lg \theta_{it} \lg (\eta_{it}/2), \quad R^2 = 0,99, \quad (18) \quad \begin{matrix} (4,2) & (7,1) \end{matrix}$$

$$h_t = \sum_{i=1}^m h_i L_{it}/L_t, \quad L_t = \sum_{i=1}^m L_{it}, \quad (19)$$

$$L_{it} = L_{it-1} + l_{it} - p_{it}, \quad (20)$$

$$p_{it} = \rho_i p_{it-1} + (1 - \rho_i) r_i L_{it-1}, \quad i = 1, \dots, m, \quad (21)$$

$$\Delta A_t = \frac{2,79}{1 - 0,65z^{-1}} \Delta L_{ot}, \quad (22)$$

$$\Delta L_{ot} = \sum_{i=1}^m k_i (l_{it} - p_{it}), \quad (23)$$

$$l_{it} = s_{it} l_t, \quad i = 1, \dots, m, \quad (24)$$

$$k_t = \sum_{i=1}^m k_i s_{it}, \quad \sum_{i=1}^m s_{it} = 1, \quad t = 1, \dots, T, \quad (25)$$

where  $L_t$ ,  $L_{it}$  is the extent of the MG at the end of the year  $t$ —in all and with a diameter  $d_i$ ;  $p_{it}$  is the extent of MG with a diameter  $d_i$  being withdrawn in

the year  $t$  as the result of wear and liquidation of OPF;  $l_t, l_{it}$  is the extent of the MG put into operation in year  $t$  -- in all and with a diameter  $d_i$ ;  $s_{it}$  is the portion of MG with a diameter  $d_i$  in the total extent of MG being put into operation;  $\rho_i, r_i$  are the parameters of the regression relations;  $h_i$  are the approximate capital outlays to construct 1 km of MG with a diameter  $d_i$  (with respect to MG of the base diameter);  $i=1, \dots, m$ ;  $h_i$  is the approximate relative cost of 1 km of MG being operated;  $k_i, k_i$  are the coefficients of adjusting the extent of the MG -- in all and with a diameter  $d_i$  -- to the equivalent, for transport operations, extent of MG of the basic diameter;  $\Delta L_{it}$  is the increase in the adjusted extent of MG;  $T$  is the duration of the forecasting period. (\*(18) and (22) are constructed on the basis of provisional series in 1970-1980.)

Let us look at individual correlations of the model (18)-(25). The first of them reflects the relation of the cost of OPF occurring per kilometer of MG, in 1000 rubles/km, to the NTP factors (through coefficient  $h_i$ ) and to the natural-geographical factors (through the coordinates of the center of extraction)\*\*. (\*\* In studying the problem of the expedience of carrying out such NTP directions as, for example, introduction of gas pipelines calculated for a pressure of 100 atm., or transport of compressed gas, model (18)-(25) should be supplemented by the indicators  $L_{it}, p_{it}, s_{it}, h_i, k_i, i=m+1, \dots, m+N$ , where  $N$  is the number of additional NTP directions relating to the directions studied.) The coefficient  $h_i$  is the relation of the average approximate cost of 1 km of MG in operation and the approximate cost of 1 km of MG with a diameter of 1020 mm. The need to introduce the coefficient  $h_i$  into (24) stems from the fact that the cost of 1 km of MG increases with the diameter. The coefficient  $h_i$  makes it possible to calculate the effect of the structural changes caused by introducing gas pipelines with a greater diameter (they reflect the level of NTP in the subsector) on the relative cost of the OPF. As the calculations made on the basis of (18) show, 40% of the rise in the relative cost of the OPF of gas pipelines in the years of the 10th Five-Year Plan are connected with structural changes directed toward increasing the portion of large-diameter MG. The remaining 60% fell to natural-geographical factors, in view of shifting the center of extraction in the northeast direction.

The correlations (20) and (21) describe the dynamics of the extent of MG. The estimates of the parameters  $\rho_i, r_i$  have values close to  $\mu$  and  $\gamma$  in (14).

In order to forecast, on the basis of (18)-(21), the extent of MG and the cost of the OPF corresponding to the given volumes of transport operations, it is necessary to link the total extent of the MG introduced with the transport operations. Since the gas pipelines introduced differ in diameter, and consequently, in productivity as well, then to obtain the objective quantitative connections between the variables being studied, the extent of MG must be reduced to the equivalent length, with respect to freight turnover, of basic-diameter MG [18, 25]. This can be done, for example, in accordance with the coefficients  $k_i = q_i/q_0$ , which characterize the change in productivity of MG  $q_i$  with relation to the productivity of the basic-diameter MG  $q_0$ :  $L_{oit} = k_i L_{it}$  (here a diameter of 1020 mm is taken as the basic one). The reduction in the extent of the MG was implemented according to the following coefficients: for MG with a diameter of 1420 mm --  $K_{1420} = 3.2$ ; for MG with a diameter of 1220 mm --  $K_{1220} = 2.2$ ; for MG with a diameter of 820 mm and less --  $K_{\leq 820} = 0.4$  [3].

After the reduction process, the dynamics of developing MG productivity are described by a time lag (22) (data for 1970-1980 were used in constructing the relationship (28) [3, 17]).

As follows from (28), on the average, introducing 1000 km of gas pipelines 1020 mm in diameter brings about, in the final analysis, an increase in transport operations amounting to 8 trln. m<sup>3</sup>/km. Five years after introduction, the increase in transport operations is 92% of this value (7.4 trln. m<sup>3</sup>/km), which corresponds to the actual productivity of the gas pipelines operated [3, 17].

On the basis of the time lag (22), the increases in the adjusted length of MG  $\Delta L_{it}$ , necessary to ensure the volumes of transport operations computed at stage I, may be determined. To calculate  $L_t$ , the increases in length of MG  $\Delta L_{it}$  should be related to the length of MG introduced  $l_{it}$ ,  $i=1, \dots, m$ .

Let us turn to correlation (23). Obviously, it can be fulfilled by various-structured variants of introducing MG  $l_{it}$ , which causes ambiguity in determining the total extent of MG. If, however, the structure of the extent of MG introduced, characterized by the relative proportions  $s_{it}$ ,  $i=1, \dots, m$ , given earlier\*, then it is not difficult to calculate, from (23)-(25), the extent of MG introduced

$$l_t = \left( \Delta L_{it} + \sum_{i=1}^m k_i p_{it} \right) / k_t; \quad l_{it} = s_{it} l_t. \quad (26)$$

(\* Under the conditions of the primary introduction of increased-diameter MG, assigning the structure for the extent of MG introduced in the models (18)-(25) is quite natural.)

After next substituting  $l_{it}$  into the system of difference equations (20)-(21), The extent of MG with varying diameters and their total quantity can be established with the given initial values  $L_{i0}$ ,  $p_{i0}$ .

We will briefly describe the procedure for calculating TEP for gas pipeline transport in accordance with the second approach. First, on the basis of correlation (22), the increases in the adjusted MG extent corresponding to the given volumes of transport operations  $A_t$  and its increases  $\Delta A_t$  (the calculation of  $A_t$  and, consequently,  $\Delta A_t$  will be made, as has already been noted, at stage I) are determined. Then, with the structure of MG introduction assigned for the future, reflected by the relative proportions  $s_{it}$ , with the aid of (26), (20), (21), (19), the extent of MG of varying diameters  $L_{it}$  and the total  $L_t$ , as well as the coefficient  $h_t$  are found. After this, with the aid of (18), (15), (17), the cost of OPF (at the beginning of the year  $\Phi_t$  and the average yearly  $y_t$ ) and the operating expenditures will be computed. Further, on the basis of the model of the OPF dynamics (11)-(14), the capital investments are calculated.

The exogenic variables in determining the value of OPF on the basis of models (18)-(25) are the volumes of transport operations  $A_t$ , their increases  $\Delta A_t$ , coordinates  $\theta_{it}$ ,  $\varphi_{it}$ , and also the relative proportions  $s_{it}$  of the varying-diameter MG introduced in the overall structure of the extent of MG introduced.

Model (18)-(25) was used in forecasting the cost of gas pipeline transport OPF; the deviation of the data from the forecast for 1983 (i.e. for 3 years ahead) from the actual cost of OPF is slightly over 3%. The deviation of the forecasts for the cost of OPF in the future from the results obtained using the method of "direct calculation" is not over 6-8%.

\* \* \*

The methodology examined makes it possible to carry out, efficiently and, as the calculations applied to gas pipeline transport show, with a high degree of accuracy, multi-variant forecasts of the dynamics of transport TEP at the initial stage of working out systems for the development and location of sectors for TEK, the TEO of developing fuel bases, and also the basic directions of economic and social development of the TEK sectors. The methodology is oriented toward using electronic computers in a dialog mode, which creates additional convenience when it is used by the workers in planning organs under the conditions of automated systems of planning computation for TEK sectors.

The method proposed for calculating freight turnover (transport operations) makes it possible, without resorting to labor-intensive computations requiring that large masses of information being drawn in, to obtain a consolidated estimate of the volumes and dynamics of one of the most important transport indicators, as well as to study the effect of the long-range territorial structure of distributing TER production and consumption on the freight turnover volumes.

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## MOTOR VEHICLES, HIGHWAYS

### NEW ROAD TO VASYUGANYE IN TOMSK OBLAST

Moscow IZVESTIYA in Russian 8 Jan 87 p 1

[Article by L. Levitskiy, IZVESTIYA correspondent, under the "On the Scene" rubric: "A High-Speed Route for the Oil Workers"; first paragraph is IZVESTIYA introduction]

[Text] Tomsk Oblast--Caravans of powerful trucks advanced from Strezhevoy to Pionernyy and Katylga. The 250-km oil field road, which was only recently turned over for use, has joined the Tomsk oil workers' center to the distant oil fields of Vasyuganye. These fields are expected to effect a major increase in oil recovery levels during this five-year plan period. The road was built by the Kazneftedorstroy [Kazakh Oil Field Road Construction] Trust.

Vasyuganye is a dense and boundless swamp. In ancient books it has even been referred to as a sea. Here, notions of terra firma, or dry land, are fairly conditional. The ground is spread with peat bogs and swells for dozens of km.

The road-building brigades from Kazakhstan immediately made sure of this. They were charged with helping the oil workers by building several field roads. The concrete highway through Vasyuganye is the longest in the Northern Tomsk Oblast. It was completed ahead of schedule, is a high-quality road and was built at a savings of funds. The Shag Trust has laid over 50 km of road per year. They have not yet been able to do so here. This is an example of organized production and labor, of concern for people, and corroborates the effectiveness of the duty-shift method.

"We have a very close and friendly relationship with the designers" said Kh. Driller, head of the Trust and an experienced engineer and economic manager, as we began our conversation. "The Soyuzdorproyekt specialists came up with a proposal for an original and genuinely Siberian construction technique. Traditionally, road construction begins with the digging of channels up to 20 meters deep. They are then filled with sand and gravel. The embankment foundation here was peat. During the winter it is quite solid enough to support heavy equipment. The sandy bed is filled in on top to a depth of several meters. Then comes a layer of concrete. In many sections, we were able to get by without pavement slabs, which have to be trucked in quite a

distance. At two of the fields roads we used slag and slurry--metallurgical industry waste--for fill.

"Unfortunately," he said, ending his account, "this experiment has not been disseminated. The river transport and railroad workers refuse to conclude a contract for mixed shipments of waste products. And they would totally eliminate the shortage of construction materials for this area of the North. At least R100,000 would be saved for every km of road."

Quite a bit of pipe culvert has been put at the base of the road embankment. The construction technique is part and parcel of the region--and this is the first important lesson taught by this construction project. Designers frequently go to Siberia with variations on ideas which have outlived their usefulness in "the West". The Trust has also refused to use the typical structure for setting up wages. It has grown and developed much like an integrated subdivision, performing all its jobs on its own.

The northern route has one man in charge. And this immediately apparent. There is not a single abandoned tree along the 250-km concrete highway. The first thing the initial road crew does is set up a saw frame, then it clears construction areas. Over 100,000 cubic meters of timber are sawn on simple sawing stands. This wood would ordinarily be stacked in brushpiles to rot. The Trust hasn't received a single cubic meter of lumber from the state stocks in five years. And not once has it asked for any. It has used its own production forces to erect sturdy settlements in Siberia. And a great many boards and beams have even been exported to Kazakhstan. Here's one more interesting example. V. Tyurin's brigade heard out on the right-of-way that there were two work-days per 24-hour period. And they immediately determined that, yes, two shifts of 12 hours "one after another" of 'round-the-clock work were completely justified.

This is the working schedule along the entire right-of-way. It is both convenient and profitable: the recompense is not in the stay but the heavy northern labor.

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## MOTOR VEHICLES, HIGHWAYS

### OFFICIAL ON AvtoVAZ ASSOCIATION IMPROVEMENTS

Moscow IZVESTIYA in Russian 30 Jan 87 p 2

[Interview with Aleksander Ibragimovich Yasinskiy, AvtoVAZ director of economics and planning, by S. Zhigalov, IZVESTIYA correspondent: "A Half-Way Policy Is Retarding Acceleration at VAZ [Volga Motor Vehicle Works] and Interfering with the Implementation of New Management Methods"]

[Text] Togliatti--The AvtoVAZ collective set itself the goal of creating and initiating series production, every five years, of a new motor vehicle which would be competitive on the world market, and of developing 10 upgraded versions of models already produced. It used to take 8-10 years to get a new economy car into production. As is well known, two years ago the association began working on self-supporting production [samookupayemost] and self-financing principles in order to speed up this process.

"We've been working under the new system for two years. But we have more confusion and mixups today than when we started." This was the unexpected tone of his assessment of the situation and the beginning of our conversation with Aleksandr Yasinskiy, AvtoVAZ's director of economics and planning.

[Question] But why? In October, when I was preparing my report on the manufacture of your 10-millionth motor vehicle, I became familiar with the results of the work done by the collective. They are impressive. Growth rates for commodity output showed a 2-fold increase compared to 1984. Labor productivity growth rates increased 3-fold. You manufactured over 7,000 above-plan economy cars.

[Answer] This is all true. The new system at VAZ works, but isn't yet providing maximum yield. As to your question of why, let me emphasize once again that we use a cost-accounting [khozraschetnyy] management mechanism. That is, everything is supposed to be done on a cost-accounting basis: renovation of production, solutions to social problems, even wage and bonus distribution. In a word, every member of our 100,000-member collective is supposed to think of himself as a production boss. But on the other hand, a few chats about independence for the enterprise won't accomplish much. The collective will only feel like it's in charge when it actually has the wage funds at its disposal.

Cost accounting has a great many genuine strengths. Here's an example. Recently our No 21 large-scale stamping shop was the talk of the town. The entire pressing works was in a fever because of malfunctions. And this shop was our main conveyor! The copies we scrapped in the debate on how to correct the situation! Finally we brought in a shop contract. A new subdivision, Shop No28-4--was set up to service the stamping shop. The success of this shop was directly related to the results produced by the shop as a whole. And you know what? Before we introduced cost accounting in the shop no more than one-fourth of the presses operated during the mornings because of "reasons beyond the control of the operators". And we haven't had any "reasons beyond the control of the operators" such as oversleeping or morning fog, for six months. The same people are still using the same equipment but the bottom line is that now they have more motivation. The collective has been working efficiently, we've forgotten all about storming and rush work, and the quality of our work has improved.

[Question] So in fact, Aleksandr Ibragimovich, all this is convincing proof of the worth of cost accounting. It is profitable for both the collective and its customers, and helps your employees to work better.

[Answer] Yes, it helps. That's precisely what it does, but not in the way we would like. It is common knowledge that all our innovations are based on the quotas which are figured for the entire five-year plan period. But in the meantime we are independent in word only. In reality the situation is something else altogether. No matter how strange it sounds, Minavtoprom is creating a situation which is rife with uncertainty by bringing, to put it lightly, what can only be termed "odd" collectives into our plans.

I agree on one thing: in accordance with a government decision, USSR Gosplan, Minfin and Minavtoprom have been ordered to allocate additional funds to set up an AvtoVAZ scientific and technical center. This center and its tasks have been mentioned in IZVESTIYA. Both Gosplan and Minfin looked promptly into the problem and allocated R160 million for the center. Minavtoprom itself found out from us about the need to finance the capital investments for what was essentially a sectorial and not a VAZ center. They were astonished when they found out about it. We're getting the impression that the ministry's main administration for capital construction is unaware of the VAZ system. And because of this, "gaps" amounting to hundreds of millions of dollars are being tolerated. This affects both the growth fund and the social-cultural personal fund. So we had planned to allocate R317 million from the social-cultural personal fund, for capital construction. We came to an agreement with the ministry on the sum. Everything seemed to be perfectly clear. But then we got the plan, and it called for an allocation of R280 million. So where are the other R37 million? It turned out that they were attempting to fit "details" from the old economic mechanism into the new cost-accounting mechanism. In accordance with custom, some reserves are left over. That is, as has always been the practice, the ministry decides how the profits earned by the labor collective will be used. But we are precisely the people who best know what to build first, and how much. The ministry tried to console us by saying, "We'll give these funds back to you in the course of the five-year plan period." But then where is the stability and the normative basis without which genuine independence is impossible?

Once again we are being forced to wear out the ministry threshold begging for funds. The principle of self-financing is being violated, and this threatens the very essence of the new economic management system. This is no more than half-done self-financing and partial cost-accounting.

[Question] The partiality to self-willed solutions to economic problems, judging by everything we've heard, is morally detrimental as well. Once again, a sort of loop-hole has opened up. Whenever the plans are disrupted, enterprise managers can put the blame on "Uncle", justifying this with references to unallocated funds. But the fact is, since the beginning of this year the entire motor vehicle-building sector, following the VAZ example, has changed over to the cost-accounting management system, which would be the same as if there never had been any attempts to limit the enterprises' independence.

[Answer] Alas, it's no easy thing to get away from bureaucratic rule. We recently received a circular letter signed by Deputy Minister A. Butuzov. The letter told us, down to the hundredth of a percent, what part of our wage fund was to be allocated for managers, engineering and technical personnel and white-collar workers out of the association employees' overall wage fund. It went gradually down from 16.21 percent in 1987 to 14.69 percent in 1990. I'm at my wit's end trying to figure how to comply with this ruling. For example, we are supposed to take on 2,000 engineers and designers to work at our scientific and technical center. It appears that in order to comply with the proportions indicated in the letter, we need to bring in an additional 12,000 workers, but we only need 3,000. If we cut down on all the secretaries and typists, then we can't all be crammed into the Procrustean bed represented by this circular.

In my opinion, this directive is a typical example of restricted independence. Moreover, it is in direct opposition to the acceleration of scientific and technical progress. While saving hundreds of thousands of rubles in the wage fund, we can lose hundreds of millions in manufactured output. Who profits by this? Where is the independence if we can't decide for ourselves how many engineers and designers we need?

[Question] Among the paramount problems associated with retooling the association are those related to equipping it with the latest equipment, automatic devices, production lines and machine tools. A competitive motor vehicle cannot be produced without these things. How is the renovation of production going at AvtoVAZ?

[Answer] We manufacture some of our own machine tools and equipment. We have plans for the current five-year plan period to manufacture some R400 million worth of the above. You'd think things couldn't be any better. But the problem is that 60 percent of this output is going to be sent to other enterprises in the country. In principle, I don't think AvtoVAZ ought to be involved in commercial machine tool-building. This leads to a dissipation of our strength. We develop our own machine-building production and only manufacture machine tools and accessories when forced to do so by acute need. But a paradoxical situation is becoming established here, too. In compliance

with the plan, we are supposed to introduce a planned capacity to manufacture VAZ-2108 and VAZ-2109 motor vehicles. This is an extremely complicated task! But to handle it, we have to use our in-house forces to manufacture R24.6 million of machine tools and equipment. And right here, the ministry is issuing us a schedule of allocations and an equally strong order relating to selling the machine tools we manufacture...to other enterprises. This is how they meet our most desperate needs. Where is the logic in this? Where is the independence?

[Question] Within the parameters of the experiment, your association can use, at its discretion, 40 percent of the currency it earns from selling your motor vehicles abroad to acquire equipment, machine tools and consumer goods.

[Answer] For the time being, and in theory. It's quite different in practice. Last year we shipped R145 million worth of motor vehicles abroad, and according to the above, should have gotten back R58 million from Avtoeksport [All-Union Automotive Export Association]. We used this figure in planning our equipment purchases. But Avtoeksport gave us only R19.5. And there is another problem here. For freely convertible currency we could theoretically acquire everything we need with no trouble. But things get a bit more complicated with currencies from CEMA countries. There are tens of millions of rubles in our association accounts which we are not allowed to use to acquire, for example, needed automatic laminating machines from the GDR and other equipment as well. Outwardly, all the conditions are being observed. But if there's no way to make use of the assets, it's just confusion! Gosplan, Gossnab and Minvneshtorg have not yet devised an effective mechanism for stimulating enterprises to develop foreign trade ties, and consequently their products are not competitive on the foreign market. What's more, since money is not being spent, thanks to these departments, they are suggesting that in general the remainder be taken off the enterprises' accounts. There's your experiment for you.

[Question] As is well known, during the current five-year plan period the association plans to initiate production of the new VAZ-2109 and VAZ-21099 models, and to manufacture the VAZ-1111 economy car, the Oka. In so doing, won't you be repeating the same miscalculations which were made when manufacturing the VAZ-2108?

[Answer] Experience has shown us that as a rule, our allied motor vehicle enterprises lag behind schedule by anywhere from six months to three years when building up special orders. In 1985, over 160,000 incompletely assembled motor vehicles were taken off the conveyor thanks to shortfalls in deliveries. The same thing happened last year. The reason? USSR Gosplan and USSR GKNT [State Committee for Science and Technology] made the deadlines for producing new motor vehicle models part of the plan for developing and introducing new technology, but failed to include the parts, assemblies and materials which make up a motor vehicle. The central planning organs have failed to coordinate the setting up of production capacities with the initiation of production of new materials and the products which go into our output. For example, the new VAZ-111 motor vehicle, the Oka, is supposed to go into production next year. Only half of the 273 designated assemblies and materials needed to get us ready for production have been received. And this

is the half-way situation we feel the effects of in practically every area of the reorganization going on at VAZ.

Editorial Comment: The VAZ experiment is a reference point for the entire country. This is why there is so much concern over indications that growth in the system mastered by AvtoVAZ is encountering so many obstacles that the VAZ workers are not always able to put the principles of self-supporting production [samookupayemost] into practice. If those who initiated the reorganization of the economy, those who have accomplished so much and who have authority and support have been encountering similar problems, then what is there to say about the hundreds of enterprises which have just been switched onto the independent management track? The material published here persuades us anew of the sort of role played by the sectorial staffs and planning agencies in implementing the reform of the economy. It is our hope that Gosplan and Minavtoprom [Ministry of the Automotive Industry] employees will express their opinions with regard to the questions touched on in this article.

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## MOTOR VEHICLES, HIGHWAYS

### CONTINUING DELAYS FOR NEW YerAZ VAN PRODUCTION

Moscow EKONOMICHESKAYA GAZETA in Russian No 5, Jan 87 p 2

[Article by A. Gordiyenko, EKONOMICHESKAYA GAZETA correspondent: "Five and One Half Years: Bureaucratic Potholes in the Road to the New Van"]

[Text] Yerevan-- The Armenian word "yeraz" means "sleep". True, the word has other meanings, but for now we will remember it as "sleep".

YerAZ also stands for the Yerevan Motor Vehicle Works and the van manufactured here. The make is fairly well known in this country, though not overly popular. What's more, the main thing known about the vans manufactured in Yerevan is their lack of popularity. They have not kept up with today's, or even yesterday's demands. For 20 years the plant conveyor has been manufacturing the same model: the YerAZ-762V. The assemblies which make up this van have been manufactured by the supplier enterprise in the same numbers, no more and no fewer, since the mid-1950's.

So the word we think of when we translate "yeraz" is no accident. The sleep enjoyed by the Yerevan Motor Vehicle Works has lasted far too long. Of course, Yerevan's motor vehicle builders have made a few changes during these 20 years. But these were minor "cosmetic" changes. The vehicle itself has remained unchanged: it has a small, car-type body and a tiny cab which is difficult for a driver to stay in for an hour, not to mention an entire shift.

The Yerevan motor vehicle builders modernized their YerAZ as much as possible. And then they simply stopped. They have only recently begun to vary the color scheme: first blue, and then beige vans come off the assembly line. But the Yerevan plant won't make it to the world marketplace in this van.

So they've developed a new van series model, the YerAZ-3730. In the opinion of authoritative commissions, it is as good as similar foreign van models of this class and designation, both in design as well as maneuverability and economy. As for the new van's body, the plant designers have protected it with an inventor's certificate.

Having developed only a single basic model, a general-purpose cargo van with a one-ton load rating, the plant can now use it as the basis for producing 12 alternate versions. Four of them have already been through tests and are

ready for series production. They include a van with a temperature-controlled body, one with a refrigerator-body, a van for moving furniture and, of course, a basic cargo van. Prototypes of the remaining 8 versions have been built and they include an electric battery-driven van and a mobile store.

Initial orders for the new YerAZ have already been placed. The Yerevan Gorispolkom Trade Administration has shown particular interest in the new van. Administration members have tried out using the van for the mobile commercial goods trade. It seems that the van can easily be driven right up to apartment house doors.

In brief, the new model has excellent prospects. But so far, these vans remain in the realm of the prospective. This vehicle, which everyone likes so well and which is so badly needed, still exists only in single one-off models. All the production schedules and programs for series production have fallen through, have been frustrated and have been crushed.

The order to prepare for series production of the new van at the Yerevan plant was issued by USSR Minavotprom [Ministry of the Automotive Industry] as long ago as 1981. It followed that the plant would be completely ready to produce the new model in 1984, and that the first lot would come off the plant conveyor in 1985.

Essentially, a new plant had to be set up to manufacture the new van. And this is why such togetherness, efficiency and organization was required of the scientific research and design institutions, the plant collective and its partners, the supplier enterprises. However, not a single one of those involved in renovating the YerAZ made the deadlines. So the plant was not ready to manufacture the van in 1984.

A new time-table has shown up. It calls for the YerAZ-3730 to be in series production no later than the 2nd six months of 1987. Is this a workable deadline?

As V. Nersesyan, director of the Yerevan Motor Vehicle Plant told me last autumn, "It's not going to be easy to meet the deadline, but that's what we're trying to do. We still need to acquire about R6 million in capital investments, finish renovating and retooling the body shop and the body priming line and finish equipping the assembly shop. We also have to finish setting up new front axle shops. And these are just the largest problems. As you see, we have lot of problems and very little time to solve them.

In November, The Yerevan Party Gorkom assembled all those responsible for renovating and retooling the enterprise--representatives of USSR Minavtoprom, the supplier plants and the scientific research institutions. And here it has become quite clear that there is still the same amount to do during the months left that was done during the preceding five years, ostensibly in the plant or on the part of the ministry.

Another thing which became clear to all those who attended this meeting was that the new time-table of preparations for series production is, to call a spade a spade, coming apart at the seams. A number of speakers cited a great

many figures which showed how far still remains to go before the plant is ready: of the 1,100 cold-stamping presses, which cost a total of R9 million, only 370 have been manufactured, only 150 of 900 the designated machine-tool and measuring attachments and only 150 of the tools. Hundreds of units of equipment and machine-tool attachments have been delivered in incomplete lots. Plant Director V. Nersesyan and Chief Engineer V. Dovlatyan made urgent requests for help. In answer, they heard counter-claims that the plant services themselves do not always act promptly, and that a number of delays were caused by the untimely placing of orders.

After arguments and discussions were over, a joint protocol was signed which clearly stated who was to do what, and when.

The gorkom meeting provided this necessary impulse: affairs at YerAZ, even if they are sluggish and do not deal with everything, are on the way to being corrected. The plant services have been stirred up, enterprise experts have visited the suppliers and have seen with their own eyes how orders are filled. The workers from Yerevan have been to KamAZ [Kama Motor Vehicle Works] and AvtoVAZ [Volga Automotive Plant Association] twice, where they ordered castings and scale models. Among themselves at the plant, they set up a group of workers headed by the director, to introduce and master the use of press tools. The group gets together daily, right in the shops. The work in the tool fabricating shop has been rejuvenated.

The work-force at YerAZ has begun preparing for the new production in real earnest: a group of workers has been organized whose purpose is to service the robotics complexes. Staffs of electronics technicians and programmers are being filled out.

We would like to have been able to conclude with the subject of the YerAZ-3730 on this optimistic note, but such is not the case.

Those at the plant still remain solidly unconvinced, even today, that the deadline will be met. Why? Director V. Nersesyan explains it this way: "Here's an example. The Kommunar Plant, in Zaporozhye is supposed to build R500,000 worth of large press tools for us, but only R140,000 was put into the ministry funds. And in fact we sent in the application a whole two years ago.

The plant needs 4 robotics complexes. One has already arrived and two others are being manufactured. But where are we going to get the fourth? At a meeting in Yerevan, USSR Minavtoprom Deputy Chief of the Main Administration for Production of Equipment and Instruments V. Teplov promised us that the problem would be solved in November. But even now this complex exists only on paper. Worse, the Yerevan workers won't see it in 1987. But they are the ones who have in fact been charged with manufacturing the assemblies for the new van, without which the production conveyer can't even start up.

And something which is a concern of the plant: once again there has been noticed an attempt by some of the partners to postpone the deadlines for filling orders. Thus, in February 1987 the Avtopromsvarka NPO [Scientific Production Association] from Zaporozhye is supposed to ship a production line



to Yerevan to be used in welding the van's side and roof panels. And right away it becomes clear that the Zaporozhyc workers are having their own problems, and won't be able to build the line until the 2nd quarter of the year. But without this line, other equipment which we've already received, will stand idle.

In 1987 the Yerevan Motor Vehicle Plant, like all the other USSR Minavtoprom enterprises, changed over to a self-financing system, with all its stringent conditions. If YerAZ fails to initiate production of this new model van within the deadline, it will find itself in an extremely difficult financial position.

It needs to be said that the Ministry of the Automotive Industry is now paying more attention than it did before to the Yerevan Motor Vehicle Plant's problems. In so doing, a way out has been opened up for many of the positions facing YerAZ. Preparations for the new production run have been put under the strict control of appropriate Minavtoprom administrations. It has been decided that Minavtoprom representatives should visit the plant every quarter for the purpose of rendering specific types of aid.

But when was this decision made? Not until now, when the second schedule for preparing to manufacture the new van has been scuttled.

Are ministry employees certain that these belated measures will produce the needed results? And are they sure that the national economy will finally receive a modern van?

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## MARITIME AND RIVER FLEETS

### CASPIAN FERRY SERVICES EXPANDED

Baku BAKINSKIY RABOCHIY in Russian 28 Dec 86 p 1

[Article: "Another Route on the Caspian"; first paragraph is BAKINSKIY RABOCHIY introduction]

[Text] Another ferry crossing, connecting Azerbaijan with Turkmeniya, has been opened up on the Caspian. The cargo-passenger ferry Sovetskaya Armeniya was the first to pass along it from Baku to the Port of Bekdash, with a call at Krasnovodsk.

"Bekdash became the third city on the Caspian, after Krasnovodsk and Altay, with which Baku was connected by a ferry crossing," said T. Akhmedov, deputy chief of the Caspian Shipping Company, to the AZERINFORM correspondent. "The opening up of this route is related to the growing volume, almost double in the last five years, of cargo transport between the Trans-Caucasus and Central Asian republics. Our ferry crossing is a unique indicator of the development of industry in fraternal republics, and all the good changes taking place in them are reflected in the number and nature of the cargoes. Electrical engineering items--air conditioners, motors--increasingly leave Baku for Central Asia. Agricultural machines and metallurgy products arrive in the Trans-Caucasus. Chemical raw material arrives at plants in Baku and Sumgait from the Port of Bekdash."

The construction workers have done a great deal in the small Turkmenian city of Bekdash. All the necessary berth structures have been erected here in a short time and dozens of kilometers of railroad tracks have been laid at the piers. The seamen and construction workers of Azerbaijan gave them a great deal of assistance in the work.

Simultaneously with the preparation for opening the new route, the fleet was augmented with ferries. The modern ships Sovetskaya Gruziya, Sovetskaya Kalmykiya, Sovetskaya Nakhicheven and a number of others which will serve the new crossing, have come to the Caspian.

In the future the Caspian people will have another ferry route created, linking Baku with the capital of Dagestan--Makhachkaloy.

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## MARITIME AND RIVER FLEETS

### NUCLEAR-POWERED ICEBREAKER CONSTRUCTION DESCRIBED

Moscow IZVESTIYA in Russian 5 Jan 87 p 1

[Article: "Giants of the Ice Routes"; first paragraph is IZVESTIYA introduction]

[Text] In the course of time, domestic nuclear-powered icebreakers will be joined by ships created in accordance with a joint Soviet-Finnish contract stipulating the design and construction of two nuclear-powered vessels--the Taymyr and Vaygach--reports V. Yeliseyev, our stringer correspondent.

They are building the Taymyr, which is now over 40-percent ready for launching, at the shipyard of the Finnish joint stock company Wartsila in Helsinki, under the supervision of the Leningrad Central Planning and Design Bureau of the USSR Ministry of the Maritime Fleet.

"The new nuclear-powered vessel will be 140.2 meters long and 28 meters wide, and its draft will be 8.05 meters," says Ye. Petrakov, head designer of the division of the Leningrad Central Planning and Design Bureau. "The icebreaker will be able to overcome, without pausing, unbroken Arctic ice floes up to 1.77 meters thick at a speed of 2 knots."

It is proposed that the crew of the nuclear-powered icebreaker Taymyr be composed of 110 persons. Well-appointed cabins, a sauna, a swimming pool, two gymnasiums, a movie theater, a library and special facilities for psychological and physical relaxation with a music-color unit will be provided for them on board. A hothouse for growing fresh vegetables during the voyage is incorporated into the plan.

A. Koshelev, ocean navigation captain and honorary polar research worker, has been appointed captain of the Taymyr.

After the icebreaker has been accepted by the Soviet side, the Taymyr will be towed to Leningrad. The building completion period is estimated as 13 months. The Taymyr will go into operation in the working icebreaker fleet of the USSR in the middle of 1989.

The Vaygach--the second nuclear-powered icebreaker of this type--is already under construction and will be turned over to the Soviet side approximately a year after the Taymyr.

## MARITIME AND RIVER FLEETS

### BRIEFS

SECOND KLAIPEDA-MUKRAN FERRY--Berlin, 10[Dec]--The Wismar shipbuilders are preparing to turn over the railway ferry Klaipeda. It will be the second of six vessels of this type. The first--the Mukran--has already been in operation for two months on the Mukran-Klaipeda line, the largest integrated project of the Soviet Union and the GDR in the sphere of transport. The vessels of this series reach 191 meters in length and are equipped with four power units with 3600 h.p. each and several auxiliary engines. The ferry covers the 273 nautical miles (506 kilometers) between the two ports in 20 hours. Over one-and-a-half kilometers of railroad tracks are laid on two decks, where 103 cars are accommodated. After all the vessels have been built, three of them will sail under the flag of the USSR and the other three under the flag of the GDR. The first weeks of operating the Mukran-Klaipeda marine railway ferry crossing showed that both the designers and the construction workers did excellent work, all its objects operate precisely and efficiently, and the cargoes have begun to arrive across the sea from both shores in a noticeably outstripping manner. [By PRAVDA correspondent S. Baygarov] [Text] [Moscow PRAVDA in Russian 11 Dec 86 p 5] 12151

BELINSKIY CANAL DREDGING COMPLETED--Astrakhan (TASS)--After reconstruction, the Belinskiy ship canal, which is on the lower course of the Volga, will be accepted by the state commission for operation. For three years, from early spring to late autumn, powerful dredgers have been cleaning the bottom of the canal, which is over 90 kilometers long. About a million cubic meters of soil have been picked up. As a result, the flow of water into the sea has increased considerably, due to which the movement of the sturgeon has become more active. The canal has now become navigable again for the tug and transport fleet. [Text] [Moscow VODNYI TRANSPORT in Russian 18 Dec 86 p 2] 12151

CRUISE SHIP GENERAL VATUTIN--Kiev--In Kiev, at the river terminal, the city's inhabitants gave a festive greeting to the new cruise ship General Vatutin. The motorship, a four-deck blue and white beauty, named after the eminent military leader General Vatutin, was constructed by shipbuilders of the German Democratic Republic at a yard in the city of Wotzenburg. With the arrival of spring, the ship will take 340 passengers on board for the first time. [By A. Usoltsev] [Text] [Moscow VODNYI TRANSPORT in Russian 1 Jan 87 p 1] 12151

CRUISE SHIP KONSTANTIN CHERNENKO--After successful completion of performance trials in the Baltic Sea, the flag will be raised on the new ocean-going passenger liner, the Konstantin Chernenko--the sixth of a series of ships of the same type, built at the Szczecin shipyard in the Polish People's Republic by order of the Soviet Union. It will be included in the fleet of the Far East Shipping Company. After supplementing the crew in Riga, the ship will set a course through the Suez Canal to Vladivostok, its permanent port of registration, and will complete the crossing of three oceans. The comfortable modern liner is equipped with the newest navigation systems, central air conditioning and stabilizers. It can take on board about 380 tourists and 150 passenger vehicles of the Zhigul type. Comfortable cabins, a music salon, a gymnasium, a swimming pool and a sauna are located on its six passenger decks. In the navigation season the motorship will operate on the Kamchatka passenger line Vladivostok-Petropavlovsk-Kamchatka, and the rest of the time it will make cruises with Soviet tourists to Japan and the countries of Southeast Asia. [By V. Mertsalov] [Text] [Moscow VODNYI TRANSPORT in Russian 25 Dec 86 p 4] 12151

TANKER AKADEMIK LUKYANENKO OPERATIONAL--Novorossiysk--The Novorossiysk Shipping Company has been supplemented with a new large-tonnage tanker, the Akademik Lukyanenko. The ship is named after Academician P.P. Lukyanenko, botanist and twice Hero of Socialist Labor. The new tanker began its working activity on a run to Yugoslavia, with 80,000 tons of petroleum products on board. [By O. Avdeyev] [Text] [Moscow VODNYI TRANSPORT in Russian 1 Jan 87 p 1] 12151

BULKER FOR FAR EAST--(TASS)--A new bulker, the Khudozhnik Kraynev, has supplemented the fleet of the Far East Shipping Company. It is designed to transport bulk cargoes. This is the third ship built since the beginning of the year by Bulgarian shipbuilders for Far East seamen. [Text] [Moscow VODNYI TRANSPORT in Russian 1 Jan 87 p 1] 12151

FINNISH-BUILT SHIPS FOR USSR--(TASS)--The dry-cargo ship Vasiliy Burkhanov has been turned over to the Sudoimport All-Union Association at the yards of the Valmet State Joint Stock Company in Helsinki. The ship, the fourth of this series, is equipped for operations under icy Arctic conditions. The Rauma-Repoli firm turned over to Soviet purchasers the tanker Dalnerechensk, designed to transport foodstuffs. The geological engineering ship Bakerit, created for the Soviet Union by shipbuilders of the Hollming Company, and fitted out with modern equipment, can carry out drilling operations even in stormy weather. Hollming has been collaborating with Soviet organizations for a long time. The flagship of the scientific research fleet, Akademik Mstislav Keldysh, and other ships were built here by order of the USSR Academy of Sciences. The shipbuilding industry of western countries is presently experiencing an acute crisis. Extremely large shipyards in the FRG, Japan, Sweden, Norway and other countries are being shut down. In Finland, the situation is different, which to a considerable extent stems from the long-established and close ties of friendship and cooperation with the Soviet Union. New forms and methods of collaboration are constantly being sought. [Text] [Moscow VODNYI TRANSPORT in Russian 8 Jan 87 p 1] 12151

SUMGAIT FERRY COMPLEX PLANNED--Baku--The Baku branch of Kaspornii projekt--the leader in the sector for planning marine ferry crossings--has taken on a new project. By order of the Caspian Shipping Company, it is preparing technical-economic substantiation for a ferry complex at Sumgait. The start of construction for the crossing is targeted for 1990. F. Mustafayev, director of Kaspornii projekt, says: "The number of ferry crossings on the Caspian is increasing considerably, but the Baku railway junction will not be developed in the future. The variant of a crossing at Komsomolsk-na-Kaspiya is economically the most advantageous on the entire western shore. Surveyors should determine the hydrometeorological characteristics of the sea in the Sumgait region and take into consideration the information available on the current and composition of the soil." [By M. Berchiyan] [Text] [Moscow VODNYI TRANSPORT in Russian 8 Jan 87 p 2] 12151

NEW VANINO-KHOLMSK FERRY--The new ferry Sakhalin-9 is in operation at the Vanino-Kholmsk ferry crossing. The Vanino-Kholmsk ferry crossing was opened 14 years ago with the arrival of the diesel-electric-powered Sakhalin-1. In this way the island is reliably linked by railroad service with the entire country. Now the modern ferry complex, equipped with ferries of the Sakhalin icebreaker type, makes it possible, regardless of the weather, to handle the regular railroad connection of Sakhalin with the mainland. The ferry fleet has been steadily growing all these years. Eight diesel-electric-powered ships have transported 10 million tons of national economic cargoes and over a million passengers. The beginner, Sakhalin-9, differs somewhat from its fellow ships: the wheelhouse on the upper deck is larger, special paint is used on the underwater part of the hull to protect against corrosion and the boiler units operate on cheaper fuel. In addition, the Sakhalin-9 is equipped with an automatic radar system to plot the courses for ship-passing, which ensures navigational safety. [Text] [Moscow IZVESTIYA in Russian 10 Feb 87 p 1] 12151

ICEBREAKER-FERRY FOR AZOV--Riga (TASS)--Construction of a new type of motor-vehicle-passenger icebreaker-ferry for Azov seamen has begun at the Riga ship repair yard. On a single run it will be able to transport about 150 passengers and 40 passenger vehicles. It differs from other ships because of its comfort and shallow draft, which will permit it to call at shallow-water ports. The Riga shipbuilders, having risen to special shockwork duty in honor of the 70th Anniversary of the Great October Revolution, have committed themselves to building the ship ahead of schedule. [Text] [Moscow VODNYI TRANSPORT in Russian 21 Feb 87 p 1] 12151

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